TELEPHONE ENGINEER & MANAGEMENT

the telephone industry magazine

JANUARY 15, 1961
Price 50c

1961 FORECAST*

GAINS IN STATIONS

INCREASED CONSTRUCTION

SOARING REVENUES

RISING PLANT INVESTMENT

*From a comprehensive survey of late reports from 404 top telephone companies

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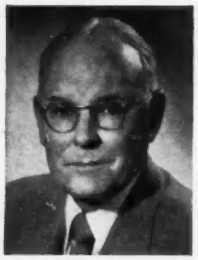
Managing Director



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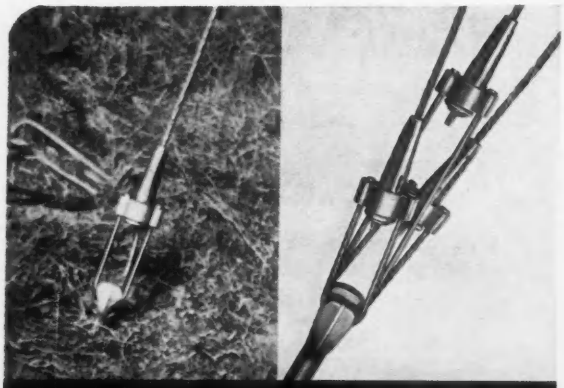

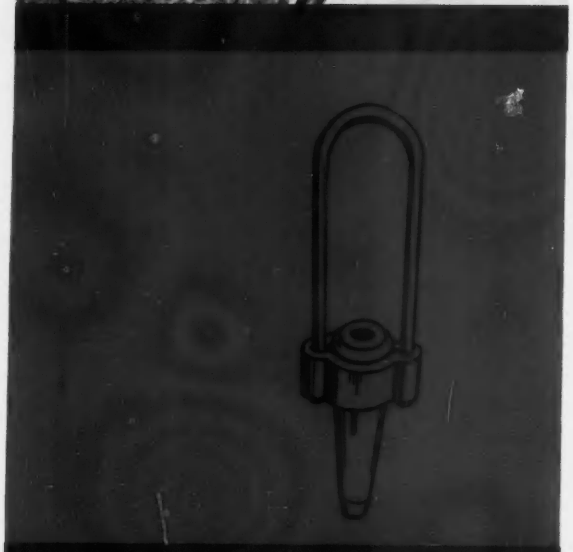

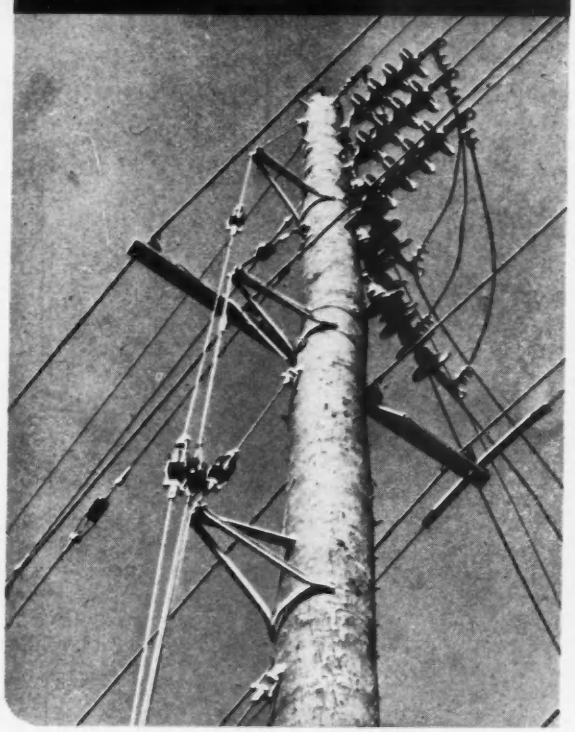

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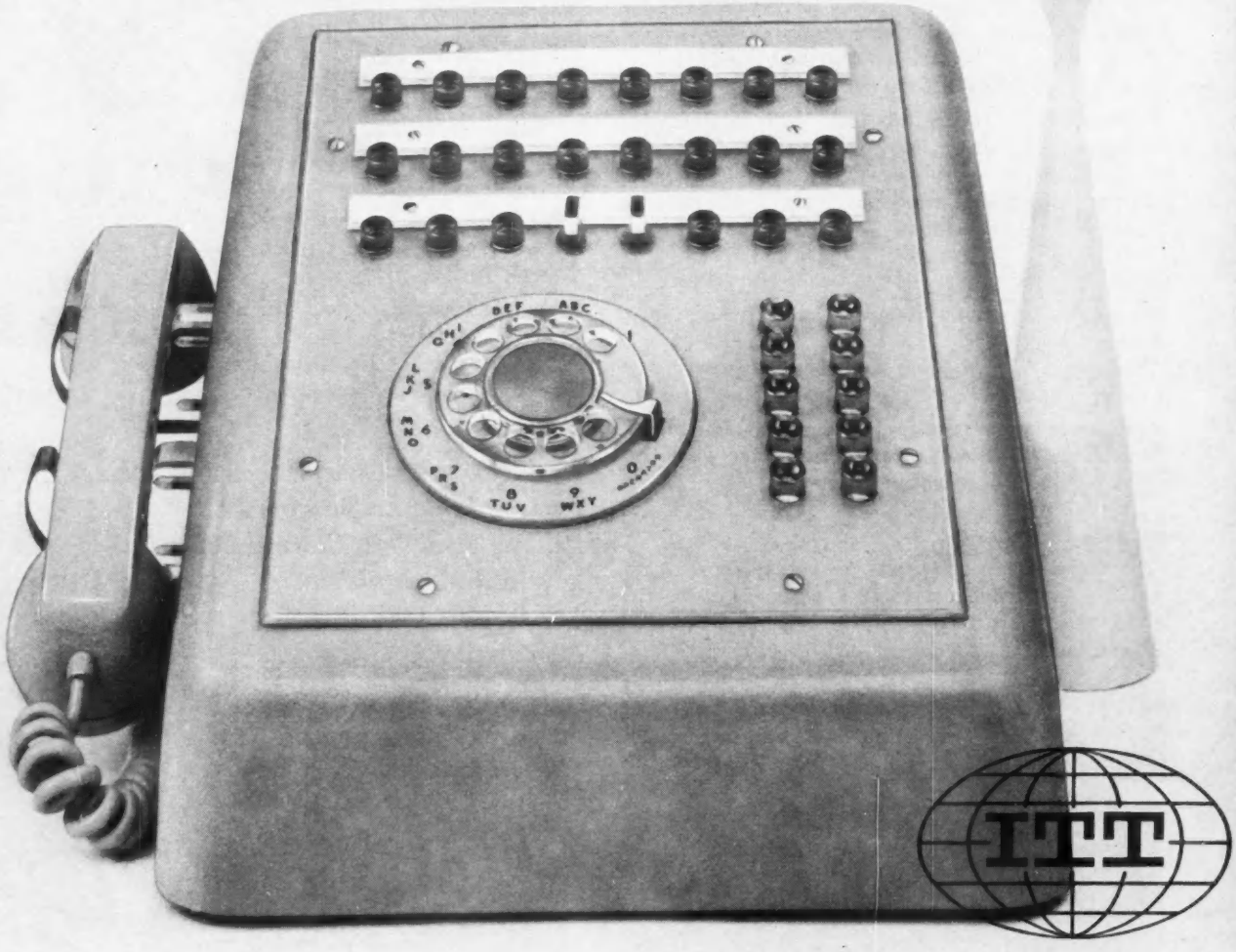

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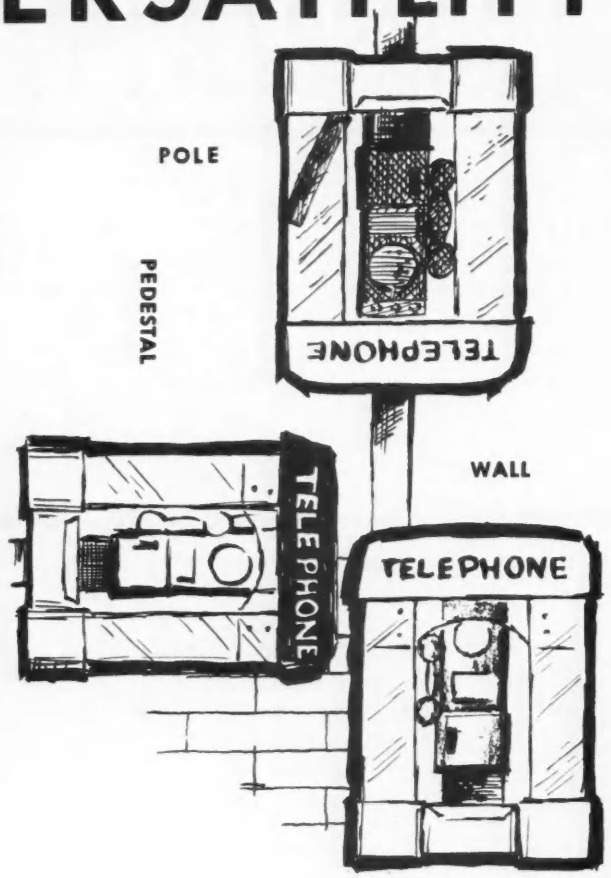

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coming CONVENTIONS

MILITARY ELECTRONICS CONVENTION, Biltmore Hotel, Los Angeles, Calif., Feb. 1, 2, 3, 1961.

LOUISIANA Tel. Assoc., Captain Shreve Hotel, Shreveport, La., Feb. 15-17, 1961.

MINNESOTA Tel. Assoc., Radison Hotel, Minn., Minn., Feb. 19-22, 1961.

KENTUCKY Tel. Assoc., Phoenix Hotel, Lexington, Ky., March 7, 1961.

TEXAS Tel. Assoc., Rice Hotel, Houston, Texas, March 12-14, 1961.

IOWA Tel. Assoc., Savery Hotel, Des Moines, Iowa, March 23-24, 1961.

INTERNATIONAL POLYTECHNIC SYMPOSIA, Auditorium of the Engineering Societies, New York City, April 4-6, 1961.

NEBRASKA Tel. Assoc., Cornhusker Hotel, Lincoln, Nebraska, April 5-6, 1961.

OHIO Tel. Assoc., Deshler Hilton Hotel, Columbus, Ohio, April 18-19, 1961.

ILLINOIS Tel. Assoc., Pere Marquette Hotel, Peoria, Ill., May 17-19, 1961.

KANSAS-MISSOURI Tel. Association, Continental Hotel, Kansas City, Mo., May 22-23, 1961.

PENNSYLVANIA Tel. Assoc., Poco Manor Inn, Poco Manor, Pa., June 5-7, 1961.

WASHINGTON-OREGON Tel. Assoc., Empress Hotel, Victoria, B. C., June 15-16, 1961.

NEW YORK Tel. Assoc., Scaroon Manor, Schroon Lake, N. Y., June 19-21, 1961.

CALIFORNIA Tel. Assoc., Hawaiian Village, Honolulu, Hawaii, June 26-30, 1961.

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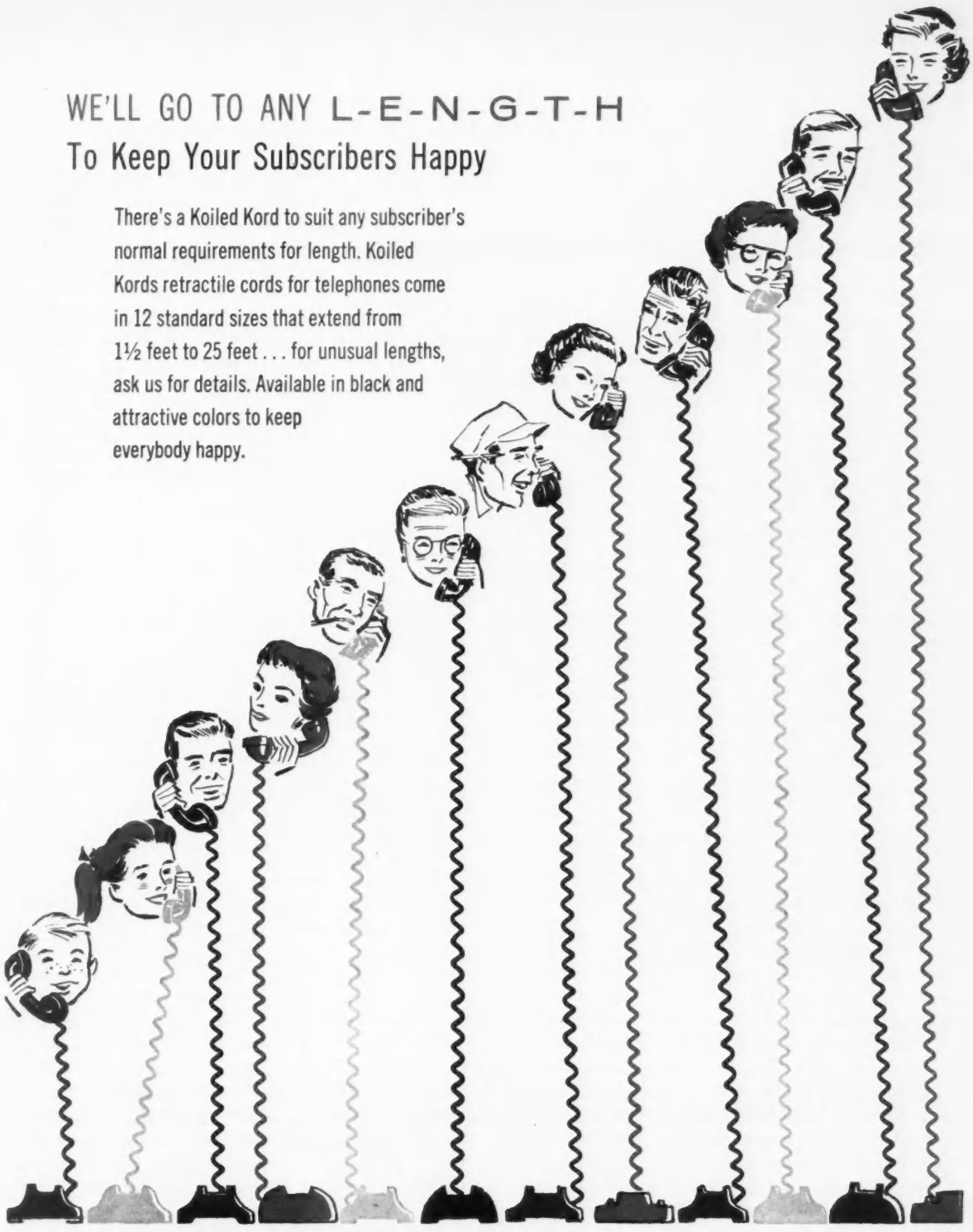

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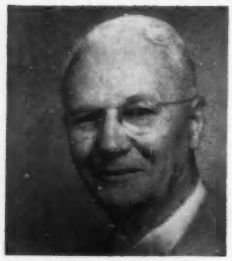


INDUSTRY OBSERVATIONS

By L. A. GRITTEN

In 1961, "Grit" believes the Independent operating companies will "enjoy just another good year with nothing much to fear, and nothing more to excite than normal progress."

Whither In 1961?

IN THE spirit of this issue, we blossom into prediction about the Independent telephone industry in 1961. This, despite the warning of James Russell Lowell (Biglow Papers) who said: "Don't never prophesy onless ye know."

Ours is a barometer industry to a considerable extent. An estimate of general conditions is prerequisite to any forecast of what our Independents may encounter this year. For that we turned to those better qualified to dip into the future. Their answers were almost anything you might imagine.

Unquestionably there is optimism in the air. Most newspaper commentators seem to feel that the Kennedy administration will breathe life into our somewhat recessed economy, without plunging us into worse inflation.

On the other hand, objective reasoners can find much food for pessimism. A recent report of the American Institute for Economic Research is full of interest for those who lived through the boom of the 1920's and its sudden painful aftermath. The report shows, for example, that the liabilities of business failures, that dropped sharply from 1933 to a negligible low in 1944-1946, have since climbed steadily; at nearly $100,000,000 they now stand higher than in the crash of the great depression.

The AIER report shows that inactive purchasing media — idle bank accounts, hoarded currency and the like, the "reserve behind the line" — rose from $10 billion in 1939 to about $55 billion after the war, but have fallen steadily to less than the 1939 figure and are still falling sharply. The article gives many similar reasons for its thinking that "the present recession may become severe."

Recently many hundreds of investment bankers were invited by *U. S. News & World Report* to predict the trend of business in 1961. The answers varied greatly. About ten per cent of these financial and economic experts are pessimistic; their prophesies range from slow decline to sharp slump. About 34 per cent of them are optimists, seeing a slow rise or, in a few cases, a sharp upturn.

That leaves about 56 per cent of them in a median group, of whom some 320 bankers predict a further dip followed by a rise, while 79 of them anticipate a "levelling out."

As a comparison of 1961 with 1960, over 96 per cent of the bankers think that this year will be either slightly better, slightly worse or about the same. We shall base our telephone forecast on that and assume that the trends indicated in the U.S.I.T.A. statistical releases will carry on to the end of 1961. What follows is roughly a projection of some of those figures.

At the end of 1961, only 3,000 of our Independent operating companies will remain. They will operate 11,900,000 telephones in 10,750 exchanges. Their plant investment will total $4,500,000,000. Their operating revenues will be $1,180,000,000. They will handle a load of 64 million conversations in an average day.

The work of these companies will be done by 102,000 telephone men and women. Here we are much in doubt. The total number of Independent employes fluctuates unpredictably from year to year, apparently under the conflicting pressures of more work done versus more automatic machinery to do it. That oft-repeated paradox that automation begets employment should be taken with salt. It is more likely that automation makes more jobs in the development and installation period only, while completed automation sharply reduces them.

About 98 percent of Independent telephones will be dial operated by the end of this year. We shall be feeling the tough resistance of a tiny "die hard" minority that will hang on to manual service (for excellent reasons in many cases) until the inevitable growth of Direct Distance Dialing forces them into automatic switching.

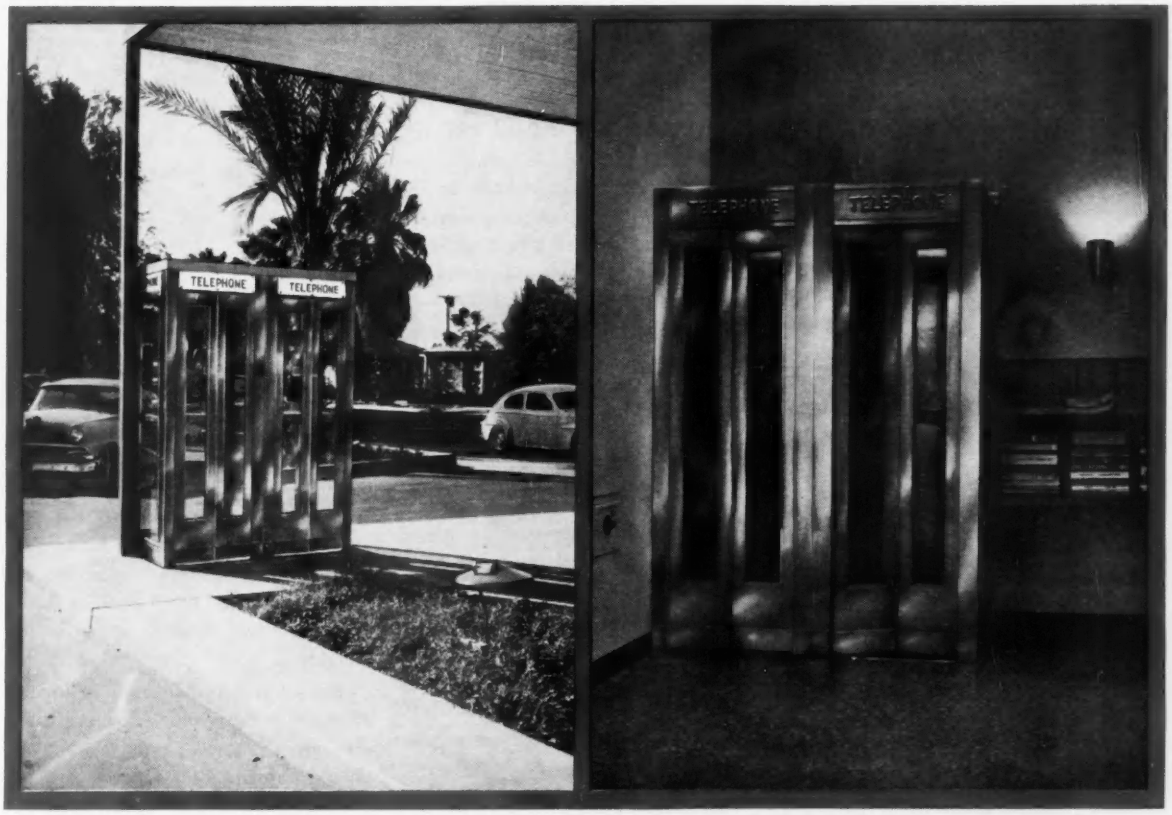
With any likelihood of an increase in the interest rate now removed, the curve of Rural Electrification Administration lending will continue to climb faster than the normal trends. By the end of this year, R.E.A. approved telephone loans will exceed $900,000,000; and the cumulative total of funds actually advanced will reach $700,000,000. Of the 750 recipients, 70 per cent will be commercial operating companies and the balance will be cooperatives.

The newer developments? We may expect a substantial increase in mobile radio installations. Probably many of the smaller companies will join hands to pass their mobile radio operations to separate corporations formed for the purpose. The interference and "compatibility" difficulties will make this advisable in many areas. Extended Area Service and big brother Direct Distance Dialing will move steadily on to the 100 per cent objective. Wide Area Telephone Service is unlikely to affect many of the smaller companies very much, apart from the battle we may expect to obtain satisfactory compensation contracts. We do not anticipate that 1961 will be a year when many corpora-

USITA

all important link in U.S.A. communications

It is the Independent telephone company that serves as the all-important link in our system of ever-expanding communications. The Independent telephone company, individually, and in concert with its fellow companies in the vigorous organization that is USITA, gives point and purpose to the forward-looking principles, policies and standards of the entire telephone industry. In the continuing aim of the Independent to modernize and broaden its service to subscribers, Sherron steel booths are the outstanding choice in the modernization programs of scores of Independent telephone companies.



The Coachella Valley Telephone Company is one of many Independents upholding the tenets and aims of the USITA. Last year, this progressive company opened a new headquarters building in Indio, date and citrus center in southern California. Headed by J. C. Newman, president, this Independent is continually demonstrating its determination to provide better telephone service to more people. As witness the phone booths pictured here. These are Sherron stainless steel booths... which, to quote Mr. E. T. Burgess, commercial and traffic manager, "help to accentuate the beauty of our new office."

as demonstrated by enterprising COACHELLA VALLEY TELEPHONE COMPANY

SEE OUR CATALOG IN SWEET'S — INDEPENDENT — Sherron ACOUSTIC SEE-THRU STEEL—STAINLESS STEEL OUTDOOR AND INDOOR TELEPHONE BOOTHS

There's a Sherron booth for every location and budget in either zinc coated or stainless steel

SHERRON METALLIC CORP., 1201 FLUSHING AVE., BROOKLYN 37, N. Y.

"Industry Observations"

(Concluded from page 8)

tions or individuals, outside of the great cities, will be prospects for so expensive a service. The WATS impact will come later.

In brief, we predict that the Independent telephone operating companies will enjoy just another good year, with nothing much to fear and nothing more to excite than normal progress, if — if those bankers are right.

They could be wrong. The new government — if it should try to live up to some of the campaign promises — could spend us into a temporary boom that would put the conservative prophets to shame. Or, if some of the sober economists are right, we may slide ungracefully into the worst mess since 1932. And, of course, we can never overlook the ugly fact that we live in an era when one vodka-primed Russian officer, or a trigger-happy American for that matter, can plunge us into a condition that will at once remove telephone service from our list of worries.

We shall know more a year hence. We promise to remind you if any of these guesses are right — and to keep discreetly silent if they are not.

Oh Debt, Where Is Thy Sting?

THE NATIONAL debt of the United States is about $290 billion. We mentioned this to a friend. He said: "Talk so I can understand. What does that mean to a telephone man?" We utterly lacked an answer. He was so right!

Subsequently we recalled some recent estimates of the age of this planet and a snappy comeback occurred to us, too late by many days: "So you are a telephone man? Well, just imagine that you have borrowed H. G. Wells' time machine and that you have travelled back in time four billion years, to the very beginnings of this earth of ours. You find another man there. Don't ask us how!

"Having read Allan Stacey's comments about telephone selling, you are of course fully imbued with the merchandising spirit and you promptly sell the fellow a telephone in his residence, with a pink extension in his bedroom. You tell him it will cost him $6 a month, plus 4 cents for mailing in his check.

"If he has kept up his payments from then until now, that is to say an outlay of $6.04 for 4,000,000,000 years, he will have paid out nearly — but not quite — the amount of our national debt. And that, by the way, is more than the combined debts of all other nations on earth by about $45 billion."

"Are You Waiting?"

HOTEL guests need worry no longer about missing their telephone calls when away from their rooms, where "Message Waiting Service" has been installed; a flashing light warns the returning guest to call the operator.

However the hotels have yet to eliminate our pet hate. We refer to advance reservations by telephone. "Same Day" reservations are handled sensibly; but future reservations, especially if a large room for a meeting is involved, generally result in a "run-around." Often enough there is a buck-passing contest between the P.B.X. operator, the catering department, the assistant manager and a mythical Mr. Blank who knows all the answers but who is invariably somewhere else. Meanwhile your long distance charges mount up. We suspect that telephone company commercial moguls and hotel managers have worked out the details in collusion, to boost our toll bills.

You are invited . . . to tell TE&M authors your problems on which you'd like to have an opinion.

Pardon My Slip

THE American Institute of Accountants says that more than $500,000,000 a year is stolen by employes from their employers; and that the average crooked employe works for six years and nine months before he starts to steal, and then steals for three years and two months before he is caught.

The solution is obvious: Employers should fire everyone with more than six years service; and employes should reform after three years of successful extra-curricular acquisition. — *Leslie A. Gritten.*

"CHARLIE" by Jim Counts

WHO IS THAT CHARACTER? HE'S ALWAYS HANGIN' AROUND!
SH-H! THAT'S MR CUSHAW... HE'S TH' CHAIRMAN OF THE BOARD ... TH' PRESIDENT... TH' VICE PRESIDENT...
... TH' TREASURER ... ..TH' GENERAL MANAGER... ... TH' SUPERINTENDENT...
AND... OH YES ... HE'S ALSO TH' OWNER!
Jim Counts

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We hope to do business with your grandson! AE plans to be in the telephone supply business for many, many years ahead. We want to receive tool orders from you... your son...and even your grandson. And, the best way we can do this is to give you *prompt delivery* from a *large stock* of *famous brands.* Please give us a call. Let us prove that—at AE, you get all 3.

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Plant has everything we need ! "We can get all our cable needs from Anaconda's new plant at Sycamore, Illinois. They make a complete range of Alpeth and Direct Burial telephone cable and distribution wire, and stock a full range of Stalpeth and Paper Lead Cable."

"Great! Having all those stocks available from Anaconda means fast delivery to the job!"

Good news bears repeating. Anaconda has built a new plant at Sycamore, Illinois, to provide greater convenience and faster delivery for the Independent Telephone Industry. Another service from Anaconda Wire and Cable Company, 25 Broadway, New York 4, N. Y. Dept. EFL-2TEM

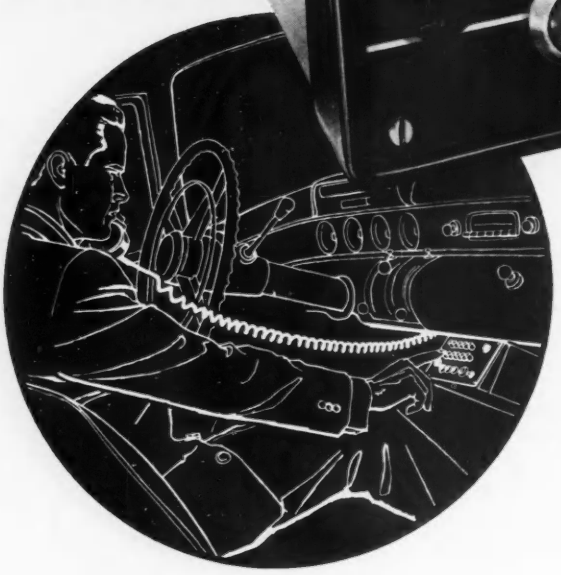
PHONE THE MAN FROM

ANACONDA®

FOR TELEPHONE WIRE AND CABLE

THE INDEPENDENT MANUFACTURER FOR THE INDEPENDENT TELEPHONE INDUSTRY

61322



Motorola Telephone-in-the-car

Fully Automatic

...for unattended service

...added revenue

Now you can provide up to the minute "telephone-in-the-car" service for business and professional men on-the-go! With Motorola Pushbutton Radiotelephone, you can expand your automatic service facilities and add to your profits, simply and easily. Here's how:

At the exchange. The Motorola system is fully automatic in operation . . . connects directly to your switching equipment with no modification for radio required.

In the car. Pushbutton number selection is convenient for the user. And with the fully telephone-engineered Motorola "telephone-in-the-car", he enjoys a service level equal to that provided to your wire line subscribers.

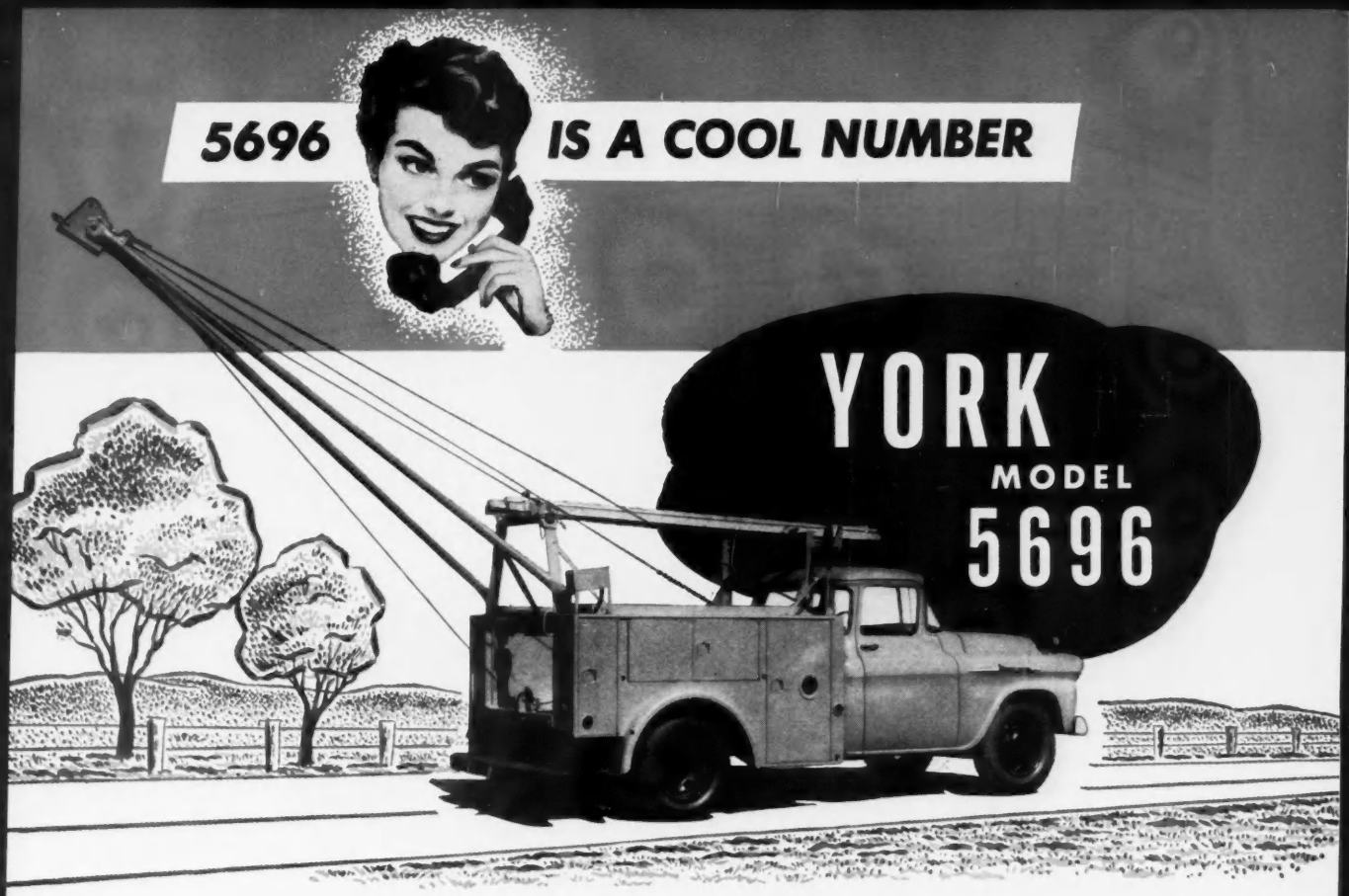
Your Motorola representative will provide full system facts—explain how your company can profit with this expanded service. And he'll give you a complete promotion program to help gain your extra revenue "telephone-in-the-car" subscribers. Call or write today.

Motorola Telephone-In-The-Car Promotion Kit includes a comprehensive program designed to sell the service in your area.

MOTOROLA PUSHBUTTON RADIOTELEPHONE

Motorola Communications & Electronics, Inc., 4501 Augusta Blvd., Chicago 51, Ill., A Subsidiary of Motorola Inc.

5696 IS A COOL NUMBER



FOR LIGHT LINE WORK, MAINTENANCE AND GENERAL SERVICE

5696 FEATURES

Mechanically operated derrick readily sets 35' pole

24' extension ladder available for overhead line maintenance

Galvannealed steel side compartments and understructure

Same tread plate floor used in larger line bodies

Compartments contain pull-out drawers, bins and thru box

Illustrating 24 ft. extension ladder pivoting on rear sheave bar with retaining sockets on rear bumper. Ladder can by used away from vehicle. Stored derrick is raised to work position in seconds by use of winch line and winch. Key locks on all compartment doors.

5696 BENEFITS

Moderately priced, extremely flexible in its work functions

Long service under rugged, every day operating conditions

Tool and materials needed for service work are readily accessible

Normal functions of light line job provided by winch and folding derrick

Backed by 66 years of Creative Engineering Service to the Public Utility Industry

CLIP AND MAIL...TODAY

YORK BODY & EQUIPMENT COMPANY
P. O. Box 446 • York, Pa.
A SUBSIDIARY OF TWIN COACH COMPANY

Dept. TC, York Body & Equipment Company
York, Pa.

Please send me a copy of Bulletin No. 946 covering your 5696 Combination Unit.

Name_____

Company_____

Address_____

City and State_____

TELEPHONE
TELEPHONE

Service from Graybar, too, is personal

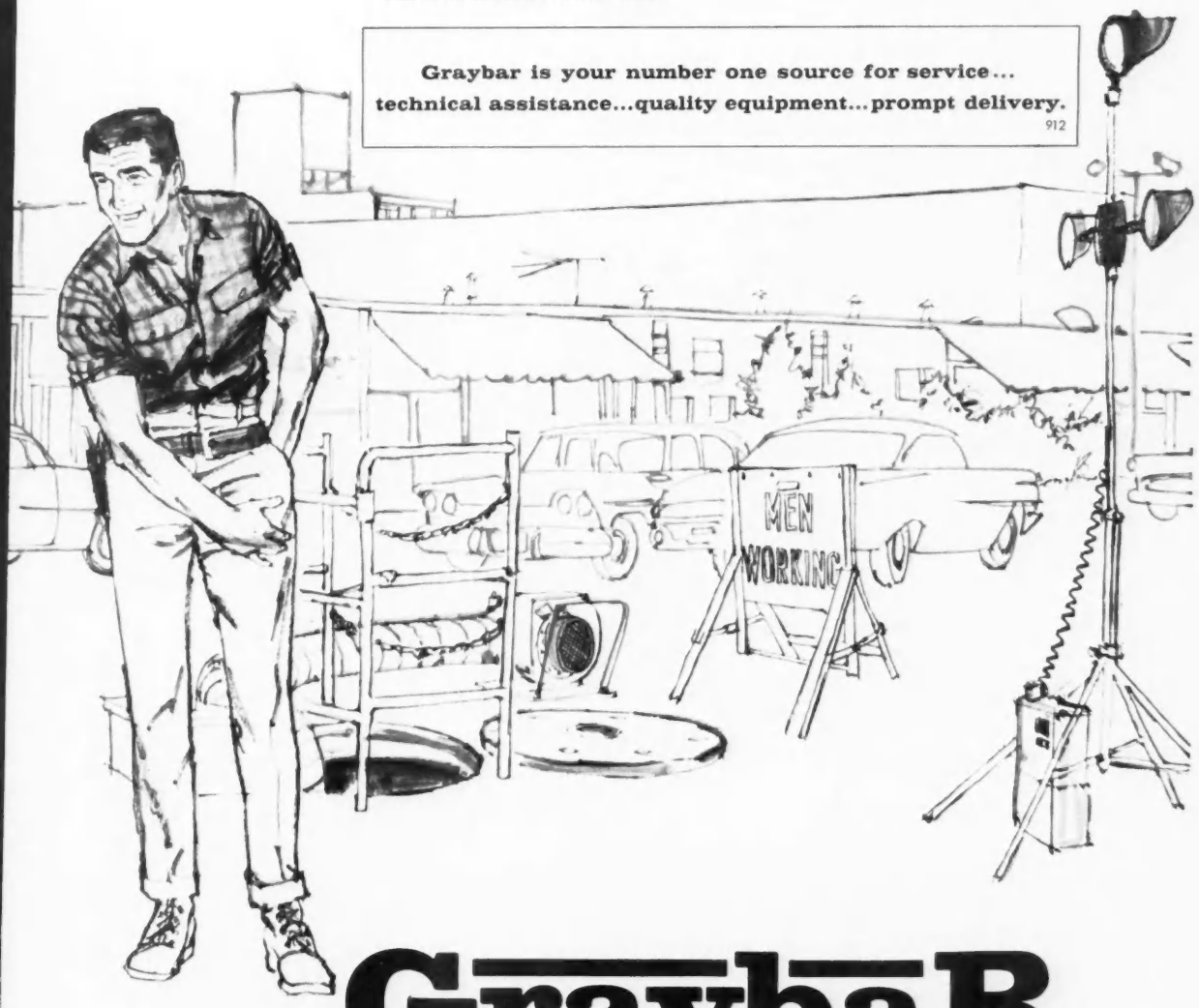
Many are the times when personal service is its own reward. With Graybar, as with the independent telephone companies, personal service is basic.

Every request you make of Graybar gets close personal attention . . . the kind of lively, consistent interest in your progress that comes most naturally from employees who own their own business. And Graybar *is* employee owned.

Whether you ask for very special delivery . . . explicit answers from the Graybar Telephone Specialist . . . or, at your convenience, an unhurried review of new products, such personal attention helps you get more done more efficiently.

Put us to the test . . . real soon.

Graybar is your number one source for service... technical assistance...quality equipment...prompt delivery.
912



GraybaR

ELECTRIC COMPANY, INC.

420 LEXINGTON AVENUE, NEW YORK 17, N. Y. • OFFICES IN OVER 130 PRINCIPAL CITIES

Everything Electrical GraybaR

Norelco® INTRODUCES NEW NE-6 VOICE REPEATER

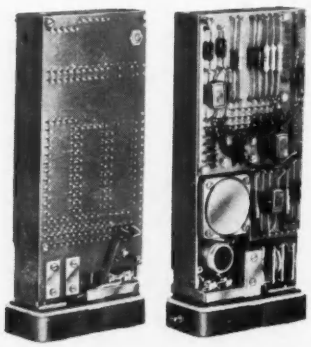
ALL IN ONE

The only **ALL IN ONE** *completely transistorized series-shunt repeater*

A COMPLETE UNIT, the Norelco NE-6 combines series and shunt repeaters with built-in network. It is suitable for both trunk and subscriber circuits, loaded or non-loaded. It can pass A.C. and D.C. signals. The NE-6 operates on a 24 or 48 volt central office battery, and each repeater requires only 15 ma. A standard nine foot rack holds 180 repeaters. Modern plug-in type construction permits the repeater to be removed from the line without interrupting the circuit.

Check these important features:

1. Suited for loaded or non-loaded facilities.
2. Operational gains:
   Intermediate Repeater: 17 db
   Terminal Repeater: 8 db
3. Compatible with A.C. and D.C. signalling.
4. Operates on central office battery, 24 or 48 volts ±30%.
5. Compact, airtight plug-in construction.
6. High quality components.
7. Quick and easy to install.



The simple strapping panel on one side of the repeater allows quick and easy network balancing by interconnection of soldering pins which are clearly marked with element values.

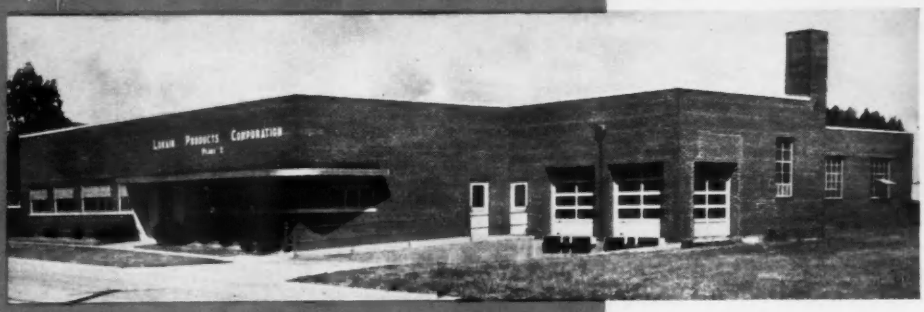
For full details contact your local distributor or:

NORTH AMERICAN PHILIPS COMPANY, INC. TELEPHONE PRODUCTS AND SYSTEMS DEPARTMENT
100 EAST 42nd STREET, NEW YORK 17, NEW YORK

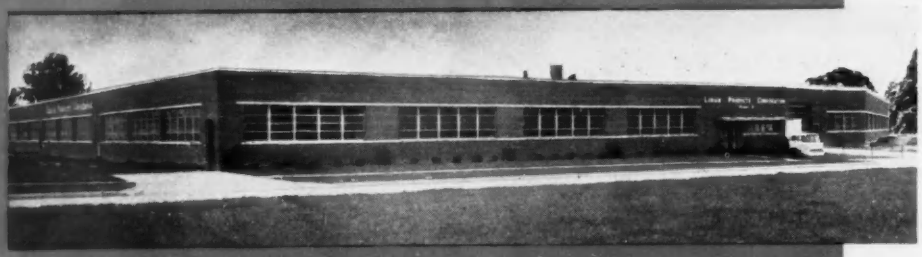
Here's where we make the "milestones"

Power equipment created by Lorain..."milestones" in the telephone industry ...is engineered and built in these four plants.

PLANT No. 1
LORAIN, OHIO
EXECUTIVE AND ADMINISTRATIVE OFFICES
RESEARCH AND DEVELOPMENT



PLANT No. 2
LORAIN, OHIO
RECTIFIER PRODUCTION



PLANT No. 3
LORAIN, OHIO
GENERAL PRODUCTION
TRANSFORMER PRODUCTION

PLANT No. 4
ST. THOMAS, ONTARIO
GENERAL PRODUCTION

LORAIN *Products Corporation* LORAIN, OHIO

LORAIN PRODUCTS (CANADA) LTD.—ST. THOMAS, ONTARIO

DESIGNERS AND MANUFACTURERS
SUB-CYCLE® CONVERTERS
FLOTROL® RECTIFIERS
PARTNERS IN DEPENDABILITY

In thirteen national magazines

New advertising campaign

New Electronic Secretary® Phone Answering Set takes messages for you 24 hours a day

Here's an economical new device to keep your business going—and growing—around the clock.

If you are sometimes out of your office during the day, the new *Electronic Secretary* Set answers every call in your since, records the message and plays it back when you return. No missed calls, no lost business. You can also use it to extend your service to nights, weekends, and holidays.

A single set can handle up to two hours of message time. One food distributor handles 4,000 orders per day with a battery of these sets. There are models to fit every need, including making announcements. And all this for a modest monthly rental that goes on your phone bill.

If you would like more information on how the *Electronic Secretary* Set can help your business, call your telephone company, or send coupon today.

Electronic Secretary Answering Sets are so useful . . . so versatile: Take sales orders, business reports, reservations, maintenance reports, complaints, suggestions, emergency calls, news items, want ads, loan applications, police reports—any call at all for any size business.

TEAR OUT. MAIL TODAY!

Electronic Secretary Industries, Inc.
Dept. 000
Waukesha, Wisconsin

Please send me free booklet on the new Electronic Secretary Answering Set.

Name _____

Firm _____

Address _____

City _____ Zone _____ State _____

ELECTRONIC SECRETARY

On duty—24 hours a day!

the Electronic Secretary® *telephone answering set minds your phone while you're aw*

Night or day—whether you're there or not—General Telephone has found a way to get the message to you.

You simply have our new Electronic Secretary Telephone Answering Set hooked to your phone. The phone rings, and your prerecorded message informs the caller you're out—asks him to leave his name, number and any message he wishes. The Electronic Secretary Set records every word.

When you return you play it back and learn who called and why. No more missed calls, no more lost business.

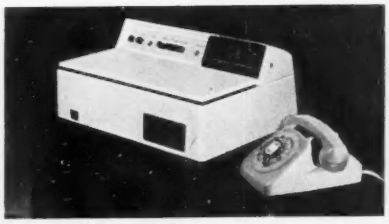
Our new Electronic Secretary Answering Sets can help in so many ways—take orders during—or sales orders after business hours, when toll rates are low—even make announcements. All for a modest monthly rental that goes on your telephone bill.

General Telephone & Electronics coordinates the manufacturing facilities of its subsidiaries to make the telephone an even more efficient and economical tool in modern life.

General Telephone & Electronics Corporation, 730 Third Avenue, New York

GENERAL TELEPHONE & ELECTRONICS

New line of ELECTRONIC SECRETARY telephone answering sets



LP(Long Play) model

The de luxe model that "does everything." Answers the phone automatically with message prerecorded by customer—(easily "erased" and changed)—records incoming messages, plays them back when customer returns. Takes any number of incoming messages up to 2-hour capacity. For service companies and individuals, stores, offices, plants and specialized uses in many other types of business.

SP (Short Play) model

This performs the same answering function as the LP model but has a more limited capacity. Answers the phone, gives message to caller, records up to twelve 13-second incoming messages. Compact, about typewriter size. Specially designed for the small service outfit or business. Low monthly rental greatly broadens the market.

AO (Answer Only) model

Answers phone with prerecorded announcement, but does not record incoming calls. Has microphone and tape recorder. Used by all sorts of organizations to deliver informative announcements up to 3 minutes. Theatres tell what's playing. Fuel suppliers and others leave numbers to call for emergency service at night. Advertisers sponsor weather reports, stock closings. Churches give inspirational messages.

will help sell your best prospects on automatic answering sets

The big push starts in February. Coast to coast, ads that talk the businessman's language will appear in magazines that businessmen read most—helping you round up a host of customers for ELECTRONIC SECRETARY® phone answering sets.

The magazines: thirteen of America's most popular publications, with 17 million circulation—sure to reach the top prospects in your area. Just look at the schedule for this introductory campaign.

4-color page

Atlantic	Feb.
Business Week	Feb. 25
Fortune	Feb.
Harper's	March
National Geographic	March
Newsweek	Feb. 27
Saturday Evening Post	Feb. 4
Time	Feb. 20
U. S. News & World Report	Feb. 13

Black and white

Business Week	Feb. 18
Dun's Review	Feb.
Nation's Business	Feb.
Saturday Evening Post	Feb. 18
Sports Illustrated	Feb. 13

Strong local support

In addition, you'll get plenty of help on the local level. First, there's a full array of newspaper ad mats, suggested TV and radio scripts and bill enclosures you can use in your own ad program. Next, a complete selling kit for your salesmen. Finally, a "package" of material to help ELECTRONIC SECRETARY set users promote their new service to the public.

Are you ready?

With today's new full line of ELECTRONIC SECRETARY answering sets, virtually every business subscriber is a potential customer. So be prepared to capitalize on this totally new source of revenue. Call or write a distributor promptly.

Electronic Secretary Industries, Inc., Subsidiary of GENERAL TELEPHONE & ELECTRONICS

GENERAL SYSTEM

distributed by

AUTOMATIC ELECTRIC SALES CORPORATION
400 North Wolf Road Northlake, Illinois

LEICH SALES CORPORATION
427 West Randolph St., Chicago 6, Illinois

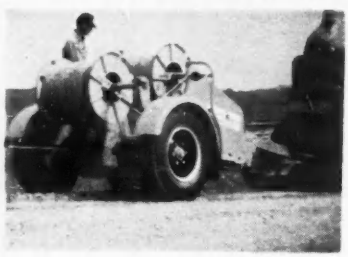
LOOK TO RYAN'S

FOR CABLE PLOWS & REEL TRAILERS

From the smallest wire to 3¼" cable

For BEAUTY in lawns & parks
use
A RYAN FRONT LAWN WIRE PLOW
No loose dirt, no mess behind

THE RYAN MODEL —C— PLOW
For all wire & cable up to 3¼" diam. to a depth reach of 42"



THE NEW RYAN COMBINATION PLOW & REEL TRAILER

Plow wire and small cable or use as a heavy duty reel trailer

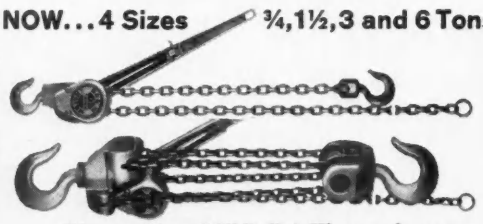
Write for literature & prices

F. B. RYAN MFG. CO.

CHARITON, IA. Phone PRescott 4-4312

New ¾-ton Type "C" Pull-A-Way

NOW...4 Sizes ¾,1½,3 and 6 Tons



WRIGHT Type "C" Pull-A-Ways make easy work of hundreds of quick hook-up jobs. Now available in four sizes—¾, 1½, 3 and 6-ton—Type "C" Pull-A-Ways are portable, safe and rugged. Corrosion-resistant modern aluminum alloy castings are used for gear case, handle and covers of all models. Hooks, load chain and chain sheave are made of alloy steel. Positive, dependable load brake securely holds load at any point. Lubricated for life. Weights. ¾-ton, 12½ lbs; 1½-ton, 23½ lbs; 3-ton, 36½ lbs; 6-ton, 63 lbs.

Write to our York, Pa., office for Bulletin DH-56

WRIGHT HOISTS

Wright Hoist Division • American Chain & Cable Company, Inc. ACCO

York, Pa., Atlanta, Chicago, Denver, Detroit, Houston, Los Angeles, New York, Philadelphia, Pittsburgh, San Francisco, Bridgeport, Conn.

SO SAFE!

let alone wire or cable!

ARROW STAPLE GUNS can't damage wire or cable because driving blade automatically stops staple at right height! That's why Arrow Staple Guns are proved safer on jobs all over the country. And Arrow staples have tremendous holding power because they're rosin-coated, have diverging points that lock into wood.

T-25 (shown) **for wires up to ¼" in diameter.** (Hi-Fi wire, radiant heating, bell, thermostat, telephone, inter-com, etc.) tapered striking edge gets into tight corners. Uses ⅜", ⅝", and ⅝" staples. List $15

T-25B For burglar alarm wiring. Drives staples flush . . . List $15

T-75 For non-metallic sheathed cable, Romex cable or any other object (such as copper tubing) up to ½" in diameter. Uses ⅜", ⅝", and ⅞" Arrow staples . . . . . List $15

ARROW FASTENER COMPANY, INC.

1 Junius St., Brooklyn 12, N. Y.

INTERNATIONAL

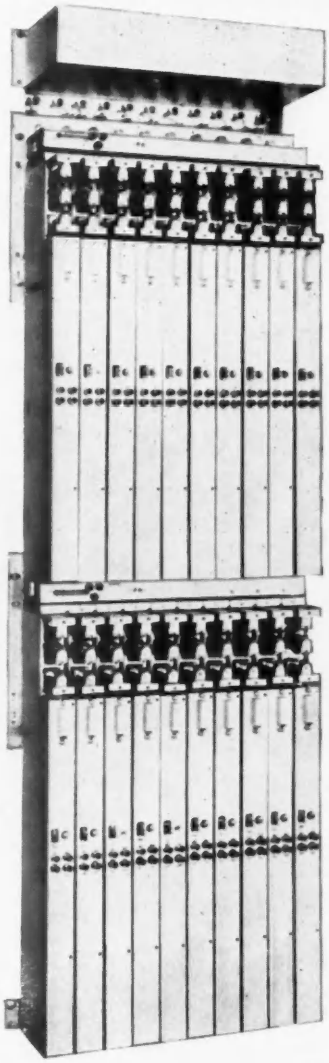
ITT

ELETRONICS

INC.

Serving the Communications Industries of the World

Relieve your growth problems with "X" URBAN Subscriber Carrier by Panhandle



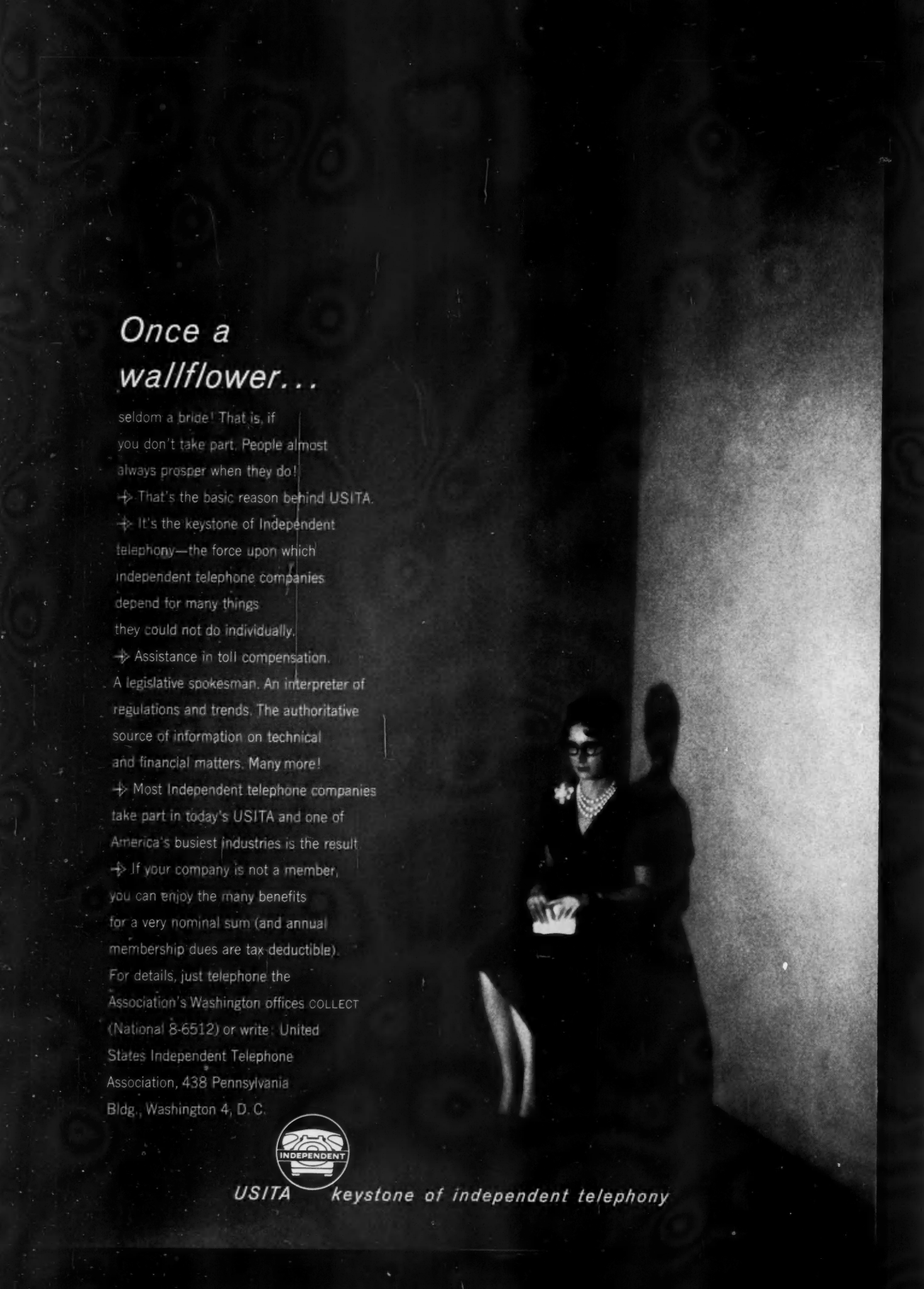
- HELD ORDERS RELIEF FOR RAPIDLY GROWING URBAN AREAS HAVING LIMITED CABLE PAIRS AVAILABLE.
- SUBSCRIBER END MOUNTED ON 19" RACK OR IN POLE MOUNTED WEATHERPROOF HOUSING.
- PROVIDES STANDBY POWER ON SUBSCRIBER END.
- EACH 20 CHANNELS REQUIRE ONLY 57¾" OF SPACE ON A 19" RACK.
- EACH 20 CHANNELS REQUIRE ONLY TWO NON-LOADED CABLE PAIR.
- DIVIDED FREQUENCY OR SUPERIMPOSED RINGING.
- TEST AND LINE-UP EQUIPMENT SIMPLIFIED AND ECONOMICAL.
- SIGNAL UNITS TO MEET ALL INDUSTRY REQUIREMENTS.
- NO EXTERNAL FILTERS OR IMPEDANCE MATCHING EQUIPMENT REQUIRED.
- MAXIMUM LOOP LIMIT IS 1200 OHMS FROM THE END OF THE SUBSCRIBER TERMINAL INCLUDING THE SUBSCRIBER TELEPHONE SET.

This system may be operated on 48 volt central office battery with cable repeaters series fed. System alignment is made simple by the use of alignment equipment especially designed for these systems.

Write or Phone for Complete Details

INTERNATIONAL TELETRONICS, INC.

644 BRANIFF AIRWAYS BUILDING • DALLAS, TEXAS • PHONE FLEETWOOD 7-8353



Once a wallflower...

seldom a bride! That is, if you don't take part. People almost always prosper when they do!

→ That's the basic reason behind USITA.

→ It's the keystone of Independent telephony—the force upon which independent telephone companies depend for many things they could not do individually.

→ Assistance in toll compensation. A legislative spokesman. An interpreter of regulations and trends. The authoritative source of information on technical and financial matters. Many more!

→ Most Independent telephone companies take part in today's USITA and one of America's busiest industries is the result.

→ If your company is not a member, you can enjoy the many benefits for a very nominal sum (and annual membership dues are tax deductible). For details, just telephone the Association's Washington offices COLLECT (National 8-6512) or write: United States Independent Telephone Association, 438 Pennsylvania Bldg., Washington 4, D. C.

INDEPENDENT

USITA keystone of independent telephony

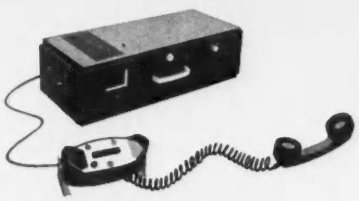
installation time:
less than 2 hours!

ACHIEVERFONE

"Installed in 1 hour and 42 minutes" . . . this is typical of installation reports regarding the new AChieverfone mobile radiotelephone by AC! AChieverfone reduces installation time because it has only two simply mounted units . . . the receiver-transmitter (complete with Selective Signaling decoder and power supply) and control head. These two units can be installed and connected in any car, truck or van with a single factory finished plug-in, control-power cable. In fact, you can install three AChieverfones in the same time it used to take to install *just one* mobile phone of another make. Ease of installation is just one reason why AChieverfone is the best common carrier system available today. It's reliable, low in cost and designed specifically for telephone company use. Consider AChieverfone! It's made to make money for you!

SPECIFICATIONS—FCC Type Accepted

Transmitter: 144-174 Mc
4 channel
RF output: 22.5 watts into 52 ohm load
Receiver: 144-174 Mc
4 channel
Wide Band (60 kc) or Narrow Band (30 kc) models available (Wide Band quickly converted to narrow by substituting IF filter)
Frequency Stability: within 0.0005%
Selective Signaling: 51,000 five-digit (compatible, 2-tone sequential) codes available
Size: Receiver-Transmitter, 21⅛" x 8⅞" x 6¼"
Weight: 35.5 pounds, including receiver-transmitter, control head and cable.



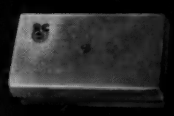
ACHIEVERFONE

Another Versatile Product of

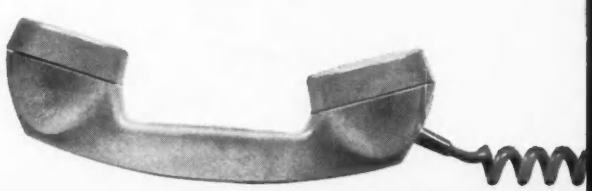
AC Spark Plug **AC** *The Electronics Division of General Motors*

Milwaukee 1, Wis. *Telephone BRoadway 3-1120*

1600-W: It's SMART . . . it's SMALL . . . it LIGHTS! The PETITE—newest, most glamorous number. And from your standpoint, most profitable. Perfect extension for any room; main station, too. Comes with new, compact wall-mounted ringer for superimposed, straight-line or harmonic ringing.



nothing newer—nothing finer
than the complete line of telephones
by Stromberg-Carlson



1573-W: (Above) Use it two ways and reap the profits! It provides two-line service plus intercom, with Hold on each line. Or, with a simple adapter, it's a three-line telephone with Hold on each line, without intercom.

1553-W: (Right) The ideal telephone for many, many applications: in kitchen, den, halls, workrooms—just about anywhere in the home. Great for your business subscribers, too—especially where space is a problem. Its slim, trim design gives it tremendous versatility.

1575-W: (Below) This 6-line telephone, used with the Stromberg-Carlson 6K-1 PBX, is the smallest phone of its kind. Flexibility and versatility are unmatched, with an almost infinite variety of services.

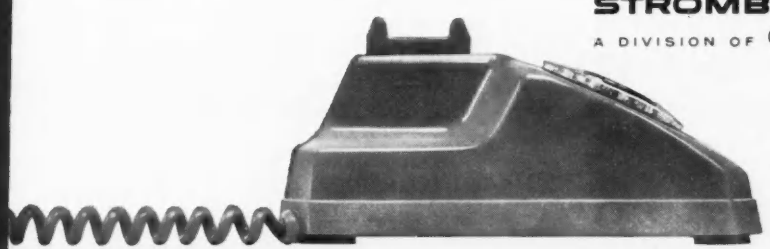
Choose from the most complete line of quality telephones in the independent field! There is nothing newer . . . nothing finer . . . nothing more profitable to you!

Stromberg-Carlson telephones mean satisfied subscribers because of superb transmission and reception quality; graceful styling; full range of smart modern colors.

Contact the Stromberg-Carlson representative in your area. He's the man with the facts, the figures and the selling aids you want.

In Atlanta call TRinity 5-7467; Chicago: STate 2-4235; Kansas City: HArrison 1-6618; Rochester: HUbbard 2-2200; San Francisco: OXford 7-3630.

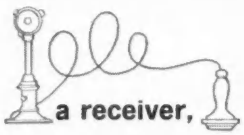
STROMBERG-CARLSON
A DIVISION OF **GENERAL DYNAMICS**



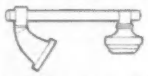
1543-W: It's handsome, compact, styled with snap and sparkle. This telephone is engineered for high fidelity of voice transmission, for ruggedness, for true full-range performance. Lightweight handset, of course.

WHAT'S REALLY NEW IN TELEPHONES?

The development of the telephone is a story of paradoxes.



The first instruments had three parts...a transmitter, a receiver, and a signaling device. Each part was a unit, with only a cord connecting one to the other.

Then an engineer, begrudging the use of both hands to handle the phone, fastened the transmitter to one end of a length of broomstick and the receiver to the other,  just far enough apart so that, with one hand, he could bring the receiver to his ear and the transmitter to his mouth.

Others, seeing this innovation, were quick to recognize its advantages.

It naturally followed that some kind of a base or holder had to be designed to hold the phone, and eventually contain the ringer.

Thus was born the "cradle phone". Later, the dial was added to the base.

This basic "cradle phone" design dates back to the 1890's! And while technological improvements have improved transmission to almost perfect levels, the basic design of the telephone has remained virtually unchanged for nearly 70 years.

Corners have been rounded, new materials used, contours have been "streamlined", color has been added...but the cradle-handset concept is still the same.

There has been one notable exception...THE NORTH ERICOFON!

Some years ago, a searching question was asked, "Why cannot the components of the telephone, necessary to make a call, be designed into a one-piece instrument?" Discarding the old concept, a design group accepted this challenge. The transmitter, receiver, and dial were redesigned into a one-piece, upright free-form telephone, and even a revolutionary transistorized tone signaling device was incorporated.

Today, and for years to come, the Ericofon stands alone as the only fresh, new, modern Telephone instrument in the world. Naturally, the Ericofon is another product of...

THE DYNAMIC FORCE IN THE TELEPHONE INDUSTRY

NORTH ELECTRIC COMPANY

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No. 1 in a series of factual presentations on North Ericofons.

TELEPHONE ENGINEER
AND MANAGEMENT'S
1961
INDUSTRY FORECAST

Telephone Industry's Growth Plans Shape Up Strong Despite Business Lag

GROWTH PACE CONTINUES

TELEPHONE ENGINEER & MANAGEMENT'S 1961 Survey of operating data supplied to TE&M's Research Department by 404 of the nation's Independent Telephone companies, representing 64.3% of the Independent telephones in service, 67% of the Independent industry's plant investment, and 69.7% of the Independent telephone industry's operating revenues, indicates the companies expect (1) station gains to continue; (2) operating revenues to rise; and (3) mounting expenditures for service improvements.

By JOHN G. REYNOLDS
Editor, TELEPHONE ENGINEER & MANAGEMENT

DESPITE a mild business downturn in 1960, which found many of the nation's economists searching for a new word to describe what was happening, gross national product crossed the half-trillion dollar mark for an all-time record of $504 billion as compared to the previous record high of $482 billion in 1959, and new records were established for personal income, total employment, industrial production, and consumer spending.

However, for business activity as a whole, 1960 was a year of rather gentle decline from the first quarter through the last quarter. In fact the recession, rolling readjustment, or whatever it might be called, actually was one of horizontal movement on a high plateau, and the word stalemate may be more appropriate than any other to describe the major trends of 1960.

But for the U. S. telephone industry, composed of American Telephone & Telegraph Co., and its 23 subsidiaries and affiliates, 3,560 Independent telephone companies, and the communications manufacturing industry, *growth* and *change* continued to highlight activities for 1960, as they have for the past decade, and at year's end it was apparent the telephone industry had passed through the 1960 business downturn with revenues on the rise, earnings mounting, continuing station gains, and mounting construction expenditures.

Early Reports Indicated Telephone Industry Increases

EARLY in 1960, while the "Soaring '60's" were turning into the "Sober '60's," reports of *Telephone Engineer & Management's Research Department*, and comments by top industry spokesmen indicated that, unlike many other industries, the telephone industry was recording increases on all fronts — number of telephones in service, long distance conversations, operating revenues, earnings, and expenditures for expansions and improvements.

● **Early in May, 1960, *Donald C. Power*, chairman and chief executive officer of General Telephone & Electronics Corp., New York City, told the New York Society of Security Analysts that based upon results "so far in**

1960, General Telephone & Electronics Corp., should have gross revenues and sales in 1960 of $1.2 billion, compared with $1.1 billion in 1959."

• In April, 1960, American Telephone & Telegraph President *Frederick R. Kappel* reported that Bell System business rose "pretty well in line with our expectations" in the first quarter of 1960, and pointed out that the station gain for the first three months "will probably exceed 750,000, long distance conversations are running about 8% ahead of 1959, and per share earnings have risen."

• In June 1960, *C. A. Scupin*, president of United Utilities Inc., Kansas City, Mo., reported, operating revenues and consolidated net income of United Utilities rose sharply in the first half of 1960, sustaining recent trends and setting record levels. Revenues increased 11% and net income was up 28%.

Further proof of the telephone industry's ability to advance despite the mild recession came in August, 1960, when the Communications Industries Division of Business & Defense Service Administration, U. S. Department of Commerce, reported, *the rate of growth of telephone installations in the United States remained constant in the first six months of* 1960.

"The number of telephones increased more than 1,650,000," BDSA stated. "If this trend continues, the total number of telephones in the United States will be 74,000,000 by the end of 1960 — amounting to a net increase of approximately 4.9% over 1959. Construction expenditure by the industry in the first six months of 1960 ran ahead the first half of 1959.

"Expenditures of $2.9 billion are expected in 1960. Operating revenues of $9 billion are anticipated for 1960, or an increase of 8% over 1959. Daily toll calls, a barometer of general business conditions, are more than 10 million, up approximately 8% from 1959. The average daily telephone conversations are nearly 260 million."

TE&M's 1961 Survey of Independent Companies

SUCH pronounced optimism is accentuated by a survey of the nation's Independent telephone companies completed this month by TE&M's *Research Department.*

Four hundred and four Independent telephone companies responded to *Telephone Engineer & Management's* request for 1959 and 1960 operating data, and forecasts for 1961.

Percentagewise the 404 reporting companies represent 38.7% of the In-

THANKS

Thanks to hundreds of Independent telephone companies for supplying us with data on their operations for 1959, 1960 and 1961. Without their help it would have been impossible to prepare this issue of TE&M.

Statistical Summary Of The Telephone Industry*

	December 31				
THE TELEPHONE INDUSTRY: [1] [2]	**1959**	**1958**	**1957**	**1956**	**1955**
Telephones (000 omitted)	70,895	66,944	63,913	60,455	56,490
Operating Companies	3,583	3,890	4,136	4,413	4,737
Telephone Exchanges	17,810	17,765	17,745	17,770	17,710
Investment In Plant (000 omitted)	$26,428,137	$24,440,428	$22,482,740	$19,929,240	$17,842,067
Operating Revenues (000 omitted)	$8,486,725	$7,746,716	$7,200,733	$6,629,840	$6,015,592
Employes	697,100	704,640	759,002	753,920	726,700
INDEPENDENT TELEPHONE COMPANIES: [1] [2]					
Telephones (000 omitted)	10,785	10,185	9,672	9,112	8,461
Operating Companies	3,560	3,867	4,113	4,390	4,714
Telephone Exchanges	10,760	10,765	10,795	10,870	10,860
Investment In Plant (000 omitted)	$3,580,369	$3,187,050	$2,801,400	$2,373,650	$2,042,820
Operating Revenues (000 omitted)	$915,189	$808,800	$733,150	$663,650	$590,150
Employes	100,000	98,300	102,902	100,920	96,900
BELL SYSTEM [3]					
Telephones (000 omitted)	60,110	56,759	54,241	51,343	48,029
Operating Companies	23	23	23	23	23
Telephone Exchanges	7,050	7,000	6,950	6,900	6,850
Investment In Plant (000 omitted)	$22,847,768	$21,253,378	$19,681,340	$17,555,590	$15,799,247
Operating Revenues (000 omitted)	$7,571,536	$6,937,916	$6,467,583	$5,966,190	$5,425,442
Employes	597,100	606,340	656,100	653,000	629,800

GROWTH DATA — 1955-1959	**BELL**	**INDEPENDENTS**	**TOTAL TELEPHONE INDUSTRY**
Telephones (000 omitted)	12,081	2,324	14,405
Operating Companies	—	—1,154	—1,154
Telephone Exchanges	200	—100	100
Plant Investment Increase (000 omitted)	$7,048,521	$1,537,549	$8,586,070
Operating Revenue Increase (000 omitted)	$2,146,094	$325,039	$2,471,133
Employes	—32,700	3,100	—29,600

*Prepared By Research Department, Telephone Engineer Publishing Corp.

[1]Base figures have been adapted for use in this report from the "1960 Annual Statistical Volume of the U. S. Independent Telephone Association."
[2]Including the United States, Alaska, Hawaii, and Puerto Rico.

[3]The Bell System data includes the Southern New England Telephone Co., the Cincinnati & Suburban Bell Telephone Co. and Bell System service telephones.

dependent exchanges, 64.3% of the Independent telephones, 67% of the Independent plant investment, and 69.7% of the Independent telephone industry's gross operating revenues. (*See Table below.*)

	Total Independent Telephone Industry Year Ended Dec. 31 1959	Total of Companies Reporting to TE&M Year Ended Dec. 31 1959	% of Independent Telephone Industry Represented by companies Reporting to TE&M
Exchanges	10,760	4,172	38.7%
Telephones	10,785,000	6,945,145	64.3%
Plant Investment	$3,580,369,000	$2,399,578,696	67.0%
Operating Revenues	$915,189,000	$637,732,958	69.7%

TE&M's analysis of the reports submitted by 404 of the nation's Independent companies indicates a continuance of the telephone industry's growth patterns. In 1959 gross construction additions of the reporting companies totaled $331,585,428. In 1960 the companies estimate gross construction additions reached $352,278,181, up $20,692,753 or 6.3% from 1959. For 1961 the reporting companies forecast gross constructions additions totaling $386,318,214, up $34,040,033 from 1960, or 9.6%.

While this continued growth in new construction expenditures may seem unusual for the years of 1960 and 1961 — when many of the nation's industries were curtailing expansion programs — continued growth in 1961 at a faster pace than 1960 is indicated by our analysis of the data submitted by the reporting companies.

Exchanges: — The 404 reporting companies entered 1960 with 4,172 exchanges. During 1960 they added 79 exchanges, to increase the total to 4,251. During 1961 the companies expect to add 76 exchanges and boost the total to 4,327. (*See Table One.*)

Central Offices: — The telephone industry's move towards total dial operation is a prime factor in the industry's continued growth in gross construction additions.

The 404 reporting companies started 1960 with 4,421 central offices — 3,669, or 83% of the C.O.'s were dial, 416, or 9% were common battery, and 343, or 8%, were magneto. During 1960 total dial central offices increased from 3,669 to 3,931, a gain of 262. During the same period common battery central offices dropped from 416 to 338 for a loss of 78, and magneto offices slipped from 343 to 236, a drop of 107.

During 1961 the reporting companies forecast a continuance of the trend towards total dial service with dial central offices increasing to 4,263, up 332 from the 3,931 in service at the end of 1960. The 1961 forecasts also indicate that common battery central offices will drop to 200, 138 down from the total of 338 reported at the end of 1960, and magneto central offices will drop to 138, down 98 from the 236 reported at the end of 1960. (*See Table Two.*)

Telephones: — Gains in telephones in service are expected to continue at a fast pace. For 1960, the 404 reporting companies reported that telephones in service increased in 1960 to 7,391,454, up 442,309 from the 6,949,145 reported at the end of

TABLE ONE: — Summary of Exchanges Operated By 404 Independent Companies Reporting To TE&M's Research Department For 1959, 1960, & 1961[1]

State	Exchanges[1] 1959	1960	1961
Ala.	31	33	34
Alaska	10	10	12
Ariz.	14	14	18
Ark.	46	49	48
Calif.	95	97	98
Colo.	13	13	14
Fla.	108	110	112
Ga.	25	25	27
Hawaii	30	30	30
Idaho	9	9	9
Ill.	400	405	412
Ind.	244	248	246
Ia.	64	72	72
Kans.	106	112	124
Ky.	58	57	62
La.	12	12	12
Maine	30	32	33
Mich.	38	39	39
Minn.	130	129	128
Miss.	5	10	10
Mo.	570	578	600
Mont.	30	35	37
Nebr.	146	147	148
N. Mex.	10	10	10
Nev.	3	3	3
N. Y.	178	177	177
N. C.	152	152	152
N. D.	94	100	101
Ohio	99	101	101
Okla.	65	70	80
Ore.	21	20	21
Pa.	205	205	205
S. C.	13	13	13
S. D.	58	59	59
Tenn.	73	73	73
Texas	486	499	500
Utah	5	5	6
Vt.	4	4	4
Va.	65	65	66
Wash.	157	157	154
W. Va.	6	6	6
Wisc.	259	261	266
Wyo.	5	5	5
Totals	4172	4251	4327

[1]Actual for 1959; estimated by reporting companies for 1960 and 1961.

TABLE TWO: — Summary of Central Offices (Dial, Common Battery, and Magneto) Operated By 404 Independent Companies Reporting To T.E.&M.'s Research Department, '59, '60 and '61[1]

State	Dial Central Offices			Common Battery C.O.'s			Magneto C.O.'s			Total Central Offices		
	1959	1960	1961	1959	1960	1961	1959	1960	1961	1959	1960	1961
Ala.	30	32	34	1	1	—	—	—	—	31	33	34
Alaska	10	10	12	—	—	—	—	—	—	10	10	12
Ariz.	13	13	18	—	—	—	1	1	—	14	14	18
Ark.	32	36	46	8	7	2	6	6	—	46	49	48
Calif.	156	168	176	4	3	0	4	0	—	164	171	176
Colo.	15	15	17	—	—	—	—	—	—	15	15	17
Fla.	144	148	153	—	—	—	—	—	—	144	148	153
Ga.	24	25	27	1	—	—	—	—	—	24	25	27
Hawaii	67	67	67	—	—	—	—	—	—	67	67	67
Idaho	8	9	9	—	—	—	1	—	—	9	9	9
Ill.	274	289	313	46	42	38	83	80	63	403	411	414
Ind.	216	233	247	40	30	17	7	4	1	263	267	265
Iowa	54	62	70	3	3	5	9	7	—	66	72	75
Kans.	95	104	112	4	5	3	8	3	7	107	112	122
Ky.	42	55	65	13	5	—	6	—	—	61	60	65
La.	12	12	12	—	—	—	—	—	—	12	12	12
Maine	25	29	30	3	3	3	2	—	—	30	32	33
Mich.	34	35	36	2	3	2	2	1	1	38	39	39
Minn.	118	121	126	5	4	2	7	5	—	130	130	128
Miss.	5	10	10	—	—	—	—	—	—	5	10	10
Mo.	360	428	532	125	101	46	86	51	24	571	580	602
Mont.	31	36	38	1	1	1	—	—	—	32	37	39
Nebr.	128	135	145	15	9	3	3	1	—	146	145	148
N. Mex.	10	10	11	—	—	—	—	—	—	10	10	11
Nev.	8	8	10	1	1	—	—	—	—	9	9	10
N. Y.	166	176	187	27	23	17	9	8	3	202	207	207
N. C.	151	152	152	1	—	—	—	—	—	152	152	152
N. D.	89	97	99	—	—	—	1	1	—	90	98	99
Ohio	114	117	118	2	1	1	2	2	—	118	120	119
Okla	42	57	70	2	2	—	24	11	10	68	70	80
Ore.	19	20	20	—	—	—	2	—	—	21	20	20
Pa.	195	198	205	7	7	6	11	8	4	213	213	215
S. C.	12	12	12	—	—	—	—	—	—	12	12	12
S. D.	56	57	58	2	1	1	—	—	—	58	58	59
Tenn.	70	71	73	1	1	—	1	—	—	72	72	73
Texas	422	452	482	41	34	18	29	15	2	492	501	502
Utah	5	5	6	—	—	—	—	—	—	5	5	6
Vt.	5	5	5	—	—	—	—	—	—	5	5	5
Va.	64	64	65	1	1	1	—	—	—	65	65	66
Wash.	159	164	166	16	13	9	1	—	—	176	177	175
W. Va.	5	5	6	1	1	—	—	—	—	6	6	6
Wis.	179	184	218	43	36	25	38	32	23	254	252	266
Wyo.	5	5	5	—	—	—	—	—	—	5	5	5
Totals	**3669**	**3931**	**4263**	**416**	**338**	**200**	**343**	**236**	**138**	**4421**	**4505**	**4601**

[1]Actual for 1959; estimated by reporting companies for 1960 and 1961.

1959. During 1961 the reporting companies expect to gain 499,110 telephones and increase their total telephones in service to 7,890,564. (*See Table Six.*)

Dial Telephones: — TE&M's analysis of the reports of the 404 companies participating in the TE&M survey gives further indication of the movement toward total dial operation.

The reporting companies started 1960 with 6,200,667 dial phones in service. During 1960 they increased the dial total to 6,784,954, for an increase of 584,287. For 1961 the companies forecast a gain of 722,371 dial phones will bring the total dial phones in service to 7,507,325. (*Table* 3.)

Common battery phones served by the reporting companies dropped from 628,150 to 513,020, for a loss of 115,130 during 1960. In 1961 the companies expect to eliminate 189,813 common battery telephones and have only 323,207 common battery telephones in operation at the end of the year. (*See Table Four.*)

Magneto telephones operated by the reporting companies dropped from 120,328 to 93,480 during 1960, for a net loss of 26,848. During 1961 the companies expect to reduce the magneto telephone total to 60,032, a drop of 33,448. (*See Table Five.*)

Gross Construction Additions

GROSS construction additions to the outside plants of the reporting companies amounted to $112,450,547 in 1959. During 1960 outside plant additions totalled $125,967,253, up $13,516,706 from 1959. In 1961 the reporting companies expect gross construction additions to the outside plant to total $131,653,107, an increase of $5,685,854 over the additions made in 1960. (*See Table Seven.*)

Station equipment will continue to take a hefty piece of the telephone company's construction dollar. In 1959 the reporting companies state

TABLE THREE: — Summary of Dial Telephones In Service As Reported By 404 Independent Companies To T.E.&M.'s Research Department For 1959, 1960, and 1961[1]

State	Dial Telephones[1] 1959	1960	1961
Ala.	15,053	16,612	21,735
Alaska	23,458	26,697	28,613
Ariz.	6,219	7,169	8,450
Ark.	19,302	21,738	29,130
Calif.	1,290,444	1,364,481	1,486,572
Colo.	3,309	3,568	4,490
Fla.	558,175	612,703	671,281
Ga.	11,349	14,806	16,385
Hawaii	191,373	208,738	224,138
Idaho	6,798	7,297	7,734
Ill.	357,288	390,936	429,662
Ind.	413,945	455,525	506,352
Ia.	47,587	52,995	56,965
Kans.	28,114	30,346	40,003
Ky.	110,155	136,570	148,200
La.	6,217	6,590	6,828
Maine	5,809	6,684	6,919
Mich.	19,074	20,198	21,256
Minn.	68,705	74,617	79,765
Miss.	2,584	3,410	3,595
Mo.	376,083	455,859	578,921
Mont.	14,413	15,554	16,403
Nebr.	117,122	134,513	157,541
N. Mex	2,047	2,188	2,400
Nev.	46,722	54,042	63,567
N. Y.	367,073	412,639	455,728
N. C.	224,801	246,091	267,719
N. D.	33,524	35,670	37,498
Ohio	266,672	279,450	289,892
Okla.	11,337	16,626	25,320
Ore.	17,105	18,992	19,899
Pa.	451,585	467,433	491,586
S. C.	17,167	18,550	19,950
S. D.	12,869	13,841	14,805
Tenn.	115,351	124,703	133,108
Texas	412,427	456,625	502,161
Utah	3,239	3,942	4,981
Vt.	5,514	5,630	5,720
Va.	95,619	103,238	110,905
Wash.	239,109	248,505	270,877
W. Va.	1,576	1,640	3,900
Wisc.	183,175	206,189	234,917
Wyo.	1,179	1,354	1,454
Totals	6,200,667	6,784,954	7,507,325

[1]Actual for 1959; estimated by reporting companies for 1960 and 1961.

TABLE FOUR: — Summary of Common Battery Telephones Operated By 404 Independent Companies Reporting To T. E. & M.'s Research Department For 1959, 1960 & 1961[1]

State	Common Battery Telephones[1] 1959	1960	1961
Ala.	3,192	3,410	—
Alaska	—	—	—
Ariz.	—	—	—
Ark.	5,543	5,409	1,620
Calif.	4,892	2,546	—
Colo.	—	—	—
Fla.	—	—	—
Ga.	1,730	—	—
Hawaii	—	—	—
Idaho	—	—	—
Ill.	91,891	84,110	73,098
Ind.	81,553	64,358	41,505
Ia.	1,243	460	—
Kan.	3,546	4,425	677
Ky.	22,225	3,910	—
La.	—	—	—
Maine	934	970	1,000
Mich.	1,310	1,585	1,660
Minn.	3,903	2,190	1,800
Miss.	—	—	—
Mo.	148,919	141,483	73,519
Mont.	1,290	1,454	1,525
Nebr.	27,787	18,091	3,346
N. Mex.	—	—	—
Nev.	1,363	1,500	—
N. Y.	80,823	55,202	35,187
N. C.	754	—	—
N. D.	—	—	—
Ohio	2,319	745	750
Okla.	3,228	3,384	—
Ore.	—	—	—
Pa.	16,702	17,192	16,263
S. C	—	—	—
S. D.	1,888	1,919	1,672
Tenn.	813	813	—
Texas	41,606	28,468	17,627
Utah	—	—	—
Vt.	—	—	—
Va.	1,424	1,498	1,546
Wash.	24,193	22,012	14,801
W. Va.	480	510	—
Wisc.	52,599	45,376	35,611
Wyo.	—	—	—
Totals	628,150	513,020	323,207

[1]Actual for 1959; estimated by reporting companies for 1960 and 1961.

TABLE FIVE: — Summary Of Magneto Telephones Operated By 404 Independent Telephone Companies Reporting T. E. & M.'s Research Department, 1959, 1960 and 1961[1]

State	Magneto Telephones[1] 1959	1960	1961
Ala.	—	—	—
Alaska	—	—	—
Ariz.	174	178	—
Ark.	815	841	—
Calif.	899	1,500	1,550
Colo.	—	—	—
Fla.	—	—	—
Ga.	—	—	—
Hawaii	—	—	—
Idaho	22	—	—
Ill.	28,297	26,453	21,601
Ind.	3,020	3,411	1,113
Ia.	2,333	1,260	—
Kan.	2,313	1,071	1,905
Ky.	1,646	240	—
La.	—	—	—
Maine	332	—	—
Mich.	553	54	54
Minn.	2,242	1,439	2
Miss	—	—	—
Mo.	31,231	21,606	12,277
Mont.	92	63	44
Nebr.	637	115	—
N. Mex.	—	—	—
Nev.	5	5	5
N. Y.	4,705	3,574	1,160
N. C.	—	—	—
N. D.	228	54	—
Ohio	491	500	—
Okla.	6,842	3,000	1,100
Ore.	783	—	—
Pa.	4,066	2,764	1,300
S. C.	—	—	—
S. D.	4	1	1
Tenn.	12	12	—
Texas	4,706	3,874	1,400
Utah	—	—	—
Vt.	—	—	—
Va.	3	3	3
Wash.	1	—	—
W. Va.	—	—	—
Wisc.	23,876	21,462	16,517
Wyo.	—	—	—
Totals	120,328	93,480	60,032

[1]Actual for 1959; estimated by reporting companies for 1960 and 1961.

TABLE SIX: — Summary of Total Telephones Operated By 404 Independent Telephone Companies Reporting To T. E. & M.'s Research Department, 1959, 1960 and 1961[1]

State	Total Telephones[1] 1959	1960	1961
Ala.	18,245	20,022	21,735
Alaska	23,458	26,697	28,613
Ariz.	6,393	7,347	8,450
Ark.	25,660	27,988	30,750
Calif.	1,296,235	1,368,527	1,488,122
Colo.	3,309	3,568	4,490
Fla.	558,175	612,703	671,281
Ga.	13,079	14,806	16,385
Hawaii	191,373	208,738	224,138
Idaho	6,820	7,297	7,734
Ill.	477,476	501,499	524,361
Ind.	498,518	523,294	548,970
Ia.	51,163	54,715	56,965
Kans.	33,973	35,842	42,585
Ky.	134,026	140,720	148,200
La.	6,217	6,590	6,828
Maine	7,075	7,654	7,919
Mich.	20,937	21,837	22,970
Minn.	74,850	78,246	81,567
Miss.	2,584	3,410	3,595
Mo.	556,233	618,948	664,717
Mont.	15,795	17,071	17,972
Nebr.	145,546	152,719	160,887
N. Mex.	2,047	2,188	2,400
Nev.	48,090	55,547	63,572
N. Y.	452,601	471,415	492,075
N. C.	225,555	246,091	267,719
N. D.	33,752	35,724	37,498
Ohio	269,482	280,695	290,642
Okla.	21,407	23,010	26,420
Ore.	17,888	18,992	19,899
Pa.	472,353	487,389	509,149
S. C.	17.167	18,550	19950
S. D.	14,761	15,761	16,478
Tenn.	116,176	125,528	133,108
Texas	458,739	488,967	521,188
Utah	3,239	3,942	4,981
Vt.	5,514	5,630	5,720
Va.	97,046	104,739	112,454
Wash.	263,303	270,517	285,678
W. Va.	2,056	2,150	3,900
Wisc.	259,650	273,027	287,045
Wyo.	1,179	1,354	1,454
Totals	6,949,145	7,391,454	7,890,564

[1]Actual for 1959; estimated by reporting companies for 1960 and 1961.

gross station equipment additions totalled $79,490,207. Additions to station equipment reached $89,193,158 in 1960, and are expected to total $90,136,397 in 1961. (*see Table Eight.*)

Central office additions totaled $105,314,558 in 1959. In 1960 the reporting companies state gross central office additions totalled $103,071,442, a drop of $2,243,116 from the additions made in 1959. However, the companies estimate that 1961 central office additions will total $120,002,476, up $16,931,034 from 1960. (*See Table Nine.*)

Land and Buildings: — Expenditures for land and buildings owned by the reporting companies amounted to $21,479,209 in 1959. This expenditure declined to $20,558,478 in 1960, a drop of $920,731 from additions made in 1959. In 1961 the reporting companies expect gross additions to land and buildings to total $30,534,360, up $9,975,882 from additions reported for 1960. (*See Table* 10.)

All Other Additions: — According to the reporting companies the value of all other construction additions is on the increase. In 1959 the additions totalled $12,850,907; in 1960, $13,487,850, up $636,943 from 1959; and in 1961 the companies expect all other additions will climb to $13,991,874, up $504,024 from 1960. (*See Table* 11.)

Total Construction Additions: — The growth pattern of total telephone industry construction additions shows a healthy upward curve, and based on the data provided by 404 telephone companies there are no prospects currently visible which would indicate a significant downturn in the industry's construction trends.

In 1959 the total gross construction additions of the companies reporting to TE&M were $331,585,428. In 1960 the companies reported gross additions of $352,278,181, for a gain of $20,692,753. For 1961, the companies forecast that construction additions will rise to $386,318,214, up $34,040,033 from 1960. (*See Table* 12.)

Communications Plant In Service: — The gains in gross construction additions — outside plant, station installations, central office equipment, land and buildings, and other additions — reported in the previous paragraphs have produced huge increases in value of the communications plants operated by the reporting companies.

At the start of 1960, the 404 reporting companies reported the total value of communications plants in service was $2,398,578,696. During 1960 the companies increased this total by $309,206,894 to $2,707,785,590. During 1961 the reporting companies forecast that total communications plant in service will reach $3,025,829,101, up to $318,043,511 from 1960. (*See Table* 13.)

Gross Operating Revenues: — Nothing short of a major economic disaster can dim the bright outlook for gross operating revenues of the telephone industry during 1961.

The reports of the 404 Independent telephone companies responding to TE&M's request for operating data indicate that the companies raised gross operating revenues from $637,732,958 in 1959 to $707,017,171 in 1960, for a gain of $69,284,213. Looking ahead to December 31, 1961, the companies forecast that gross operating revenues will climb to $776,-

TABLE SEVEN: — Summary of Gross Construction Additions — Outside Plant 404 Independent Telephone Companies Reporting To T. E. & M.'s Research Department For 1959, 1960, and 1961[1]

State	Construction Additions— Outside Plant 1959	1960	1961
Ala.	$ 772,726	$ 547,070	$ 671,316
Alaska	993,551	244,204	541,356
Ariz.	—	—	—
Ark.	107,627	551,063	625,181
Calif.	21,784,875	23,056,181	22,372,055
Colo.	224,533	49,472	240,759
Fla.	10,744,566	13,484,693	14,670,118
Ga.	315,809	348,209	532,000
Hawaii	3,252,672	4,904,200	4,612,000
Idaho	73,627	89,757	60,015
Ill.	4,785,259	6,379,816	7,597,590
Ind.	5,209,958	5,929,701	5,527,974
Ia.	1,012,481	1,042,598	979,872
Kans.	802,531	1,571,835	1,535,575
Ky.	3,069,285	3,126,000	1,657,000
La.	404,326	70,036	121,000
Maine	332,034	228,982	115,000
Mich.	507,531	222,046	661,500
Minn.	377,614	857,487	797,500
Miss.	26,345	513,745	38,171
Mo.	8,201,834	10,765,192	11,219,567
Mont.	500,098	365,420	331,600
Nebr.	2,790,846	2,927,478	2,709,482
N. Mex.	16,016	34,059	27,000
Nev.	1,549,816	1,450,067	1,709,033
N. Y.	7,572,053	7,243,414	7,145,400
N. C.	3,829,799	5,248,661	5,187,695
N. D.	2,284,516	1,279,834	696,121
Ohio	3,863,800	3,575,420	3,654,000
Okla.	577,970	698,543	994,215
Ore.	246,569	261,605	252,915
Pa.	5,229,640	6,040,959	5,881,457
S. C.	189,077	541,201	325,000
S. D.	1,437,658	389,121	439,625
Tenn.	1,927,498	1,532,363	1,636,719
Texas	6,468,489	7,433,080	11,469,081
Utah	—	—	—
Vt.	26,252	36,000	42,000
Va.	2,368,915	2,328,325	2,456,099
Wash.	4,225,176	5,775,966	5,071,680
W. Va.	8,000	53,000	152,000
Wisc.	4,273,833	4,699,450	6,694,436
Wyo.	65,342	71,000	202,000
Totals	**$112,450,547**	**$125,967,253**	**$131,653,107**

[1]Actual for 1959; estimated by reporting companies for 1960 and 1961.

TABLE EIGHT: — Summary of Gross Construction Additions —Station Equipment, of 404 Independent Telephone Companies Reporting to T.E.&M.'s Research Department, 1959, 1960, and 1961[1]

States	Construction Additions — Station Equipment 1959	1960	1961
Ala.	$ 215,222	$ 117,920	$ 69,000
Alaska	546,188	511,402	445,033
Arizona[2]	—	—	—
Ark.	35,774	90,474	152,851
Calif.	23,212,544	26,321,187	25,392,028
Colo.	77,541	11,239	32,993
Fla.	8,298,917	9,531,343	9,525,088
Ga.	251,871	137,922	287,400
Hawaii	3,169,275	3,905,000	4,094,300
Idaho	46,676	63,008	47,200
Ill.	3,776,635	4,383,414	4,369,175
Ind.	4,868,519	5,298,290	5,535,911
Iowa	282,397	370,781	297,628
Kans.	210,334	246,623	278,542
Ky.	1,514,629	2,039,000	1,172,000
La.	47,033	32,721	38,000
Maine	107,239	56,913	17,100
Mich.	223,727	83,659	144,830
Minn.	115,741	384,734	254,600
Miss.	5,700	41,200	6,800
Mo.	5,198,641	6,224,190	5,840,342
Mont.	83,800	89,846	104,300
Neb.	1,280,476	1,144,478	1,413,944
N. Mex.	17,996	17,673	18,000
Nev.	1,312,889	1,627,937	1,665,619
N. Y.	4,762,822	5,784,535	6,609,350
N. C.	2,337,228	2,616,404	2,750,015
N. D.	329,001	347,764	275,785
Ohio	1,827,469	1,717,123	1,684,151
Okla.	187,204	244,424	305,105
Ore.	97,433	262,696	233,685
Pa.	2,642,296	4,089,288	4,026,002
S. C.	161,782	150,677	159,000
S. D.	341,911	70,012	75,025
Tenn.	1,200,239	1,011,097	1,071,026
Texas	4,052,468	4,077,154	4,716,944
Utah[2]	—	—	—
Vt.	33,148	39,500	30,000
Va.	674,675	476,671	552,663
Wash.	3,588,885	3,496,778	3,640,130
W. Va.	7,400	12,000	80,000
Wis.	2,328,559	2,059,081	2,724,332
Wyo.	17,923	7,000	500
Total	**$79,490,207**	**$89,193,153**	**$90,136,397**

[1]Actual 1959; estimated by reporting companies for 1960 and 1961.
[2]Unavailable.

TABLE NINE: — Summary of Gross Construction Additions — C. O. Equipment, 404 Independent Telephone Companies Reporting to T.E.&M.'s Research Department, 1959, 1960, and 1961[1]

States	Construction Additions — Central Office Equipment 1959	1960	1961
Ala.	$ 592,282	$ 133,714	$ 393,459
Alaska	1,298,551	223,718	118,951
Arizona[2]	—	—	—
Ark.	48,019	260,871	381,628
Calif.	28,144,833	18,461,775	15,732,339
Colo.	153,979	23,959	41,000
Fla.	8,830,106	11,600,909	15,946,715
Ga.	31,870	173,014	444,620
Hawaii	3,419,703	4,833,800	5,633,900
Idaho	63,133	78,811	107,500
Ill.	4,276,790	6,445,343	10,725,389
Ind.	7,023,333	5,717,960	5,800,432
Iowa	413,790	721,795	547,260
Kans.	337,827	400,448	658,438
Ky.	2,720,616	2,444,000	1,381,020
La.	33,248	41,539	32,500
Maine	153,356	73,666	71,000
Mich.	298,599	58,671	405,600
Minn.	223,435	430,984	376,150
Miss.	1,800	103,300	2,000
Mo.	7,865,729	9,977,131	10,342,481
Mont.	111,419	622,084	405,070
Neb.	2,171,145	2,004,810	2,162,177
N. Mex.	45,891	23,000	40,000
Nev.	1,085,439	885,941	1,684,503
N. Y.	4,201,447	4,658,970	6,739,600
N. C.	2,228,273	2,819,413	3,869,660
N. D.	748,750	601,188	213,500
Ohio	2,061,353	2,378,228	2,362,025
Okla.	271,797	244,199	433,000
Ore.	178,310	414,494	334,591
Pa.	4,435,063	5,540,454	5,278,500
S. C.	75,519	191,315	350,500
S. D.	470,911	155,660	100,950
Tenn.	2,862,126	1,627,818	1,735,191
Texas	7,891,411	10,531,994	14,303,692
Utah[2]	—	—	—
Vt.	3,700	10,417	122,500
Va.	1,298,107	759,859	1,524,366
Wash.	5,642,253	5,158,300	4,536,250
W. Va.	5,000	3,000	134,000
Wisc.	3,523,099	2,220,890	4,420,019
Wyo.	72,546	14,000	110,000
Total	**$105,314,558**	**$103,071,442**	**$120,002,476**

[1]Actual for 1959; estimated by reporting companies for 1960 and 1961.
[2]Unavailable.

058,927, for an increase of $69,041,756. (*See Table* 14.)

Bell To Spend $2.5 Billion

DURING 1961, $2.5 billion will be spent by the Bell System on service improvements and expansion, American Telephone & Telegraph Co. President Frederick R. Kappel reported last month.

"This $2.5 billion program is the most tangible evidence we can offer of our confidence in the essential soundness of the economy and in the future growth of our industry," Kappel stated.

The Bell System's planned expenditure of $2.5 billion on expansion and improvements in 1961, was broken down to show that the expenditures will include $800,000,000 for central office equipment; about $600,000,000 for lines and channels linking central offices and customers to central offices; more than $700,000,000 for telephones and other equipment on customers' premises; and more than $200,000,000 for land and buildings.

The extension of new protected underground transcontinental coaxial cable will account for another $52,000,000; bypass routes for some $12,000,000; submarine cables to Antigua, Jamaica, and Bermuda for about $14,000,000; and the new cable-laying ship to be constructed for the AT&T Long Lines Department for $9,000,000.

The 1961 expansion program will result by the end of 1961 with 98% of the Bell System's telephones being dial operated and more than 60% having direct distance dialing. Residential individual line service will reach a 65% level, and every third residential user will have an extension telephone. By the end of 1961, the Bell System's investment in plant will have reached $25 billion.

Looking to the future, the AT&T President envisioned a mushrooming growth in requirements for overseas facilities to handle voice, data, and television communications.

"This need will be met by an accelerated undersea cable program as well as by space facilities," he said. "Within two years, we will have our own cable-laying ship to help us provide facilities faster."

The year-end statement noted a Bell System gain in 1960 of some 2,800,000 telephones, an increase of about 7% in long distance calling, extension of direct distance dialing to half of the Bell System's customers, and dial-operated telephones reaching to 97% of the total of 60,700,000 Bell phones in use as the year ended.

Mr. Kappel said the field of business communications, including the rapid transmission of business data, will be a fast-growing one in 1961. He mentioned two examples of ways Bell is meeting these needs.

"Our Data-Phone service . . . already has good acceptance," he said. "We think it will play an even bigger role in business in the next few years. Another service improvement is the plan we announced to provide unlimited interstate calling within specified areas for a flat monthly rate."

A $24,903,000 construction program for calendar 1961, including a number of major projects, was filed for approval of the FCC in 1960 by the American Telephone & Telegraph Co. Long Lines Department, in the annual submission of Long Lines' overall '61 construction program.

The program, to be participated in

TABLE 10: — State Summary of Gross Construction Additions — Land & Buildings — of 404 Independent Telephone Companies Reporting to T.E.&M.'s Research Department 1959, 1960, and 1961[1]

States	Construction Additions — Land & Buildings[1] 1959	1960	1961
Ala.	$ 113,281	$ 43,975	$ 190,800
Alaska	310,745	47,666	17,000
Ariz.[2]	—	—	—
Ark.	3,667	43,552	100,500
Calif.	5,727,640	5,776,030	7,448,874
Colo.	30,702	3,647	59,021
Fla.	1,479,196	2,125,154	4,132,000
Ga.	71,019	17,077	215,600
Hawaii	462,946	660,000	2,227,700
Idaho	11,209	3,439	3,700
Ill.	611,401	1,232,624	1,926,667
Ind.	660,737	1,124,100	1,365,539
Ia.	113,827	236,027	31,000
Kans.	76,017	76,474	196,717
Ky.	267,434	146,500	153,500
La.	11,007	6,792	—
Maine	64,270	30,373	19,000
Mich.	151,084	15,387	106,350
Minn.	39,920	219,089	32,500
Miss.	1,700	—	—
Mo.	2,256,379	1,910,217	2,633,503
Mont.	4,214	110,930	186,000
Neb.	612,769	165,700	121,000
N. Mex.	9,313	—	2,000
Nev.	788,163	61,002	194,262
N. Y.	1,152,020	1,098,086	705,500
N. C.	176,188	255,114	399,021
N. D.	171,599	162,400	9,600
Ohio	587,788	677,201	791,000
Okla.	66,822	22,928	36,000
Ore.	13,567	65,398	15,930
Pa.	1,036,954	1,011,012	946,500
S. C.	77,594	55,000	35,000
S. D.	235,519	91,934	22,313
Tenn.	860,988	156,667	192,564
Texas	1,364,376	1,560,614	1,485,878
Utah[2]	—	—	—
Vt.	405	2,288	—
Va.	206,142	223,813	203,319
Wash.	709,030	531,100	2,902,150
W. Va.	—	1,000	67,000
Wisc.	922,828	586,168	1,359,352
Wyo.	18,749	2,000	—
Totals	$21,479,209	$20,558,478	$30,534,360

[1]Actual for 1959; estimated by reporting companies for 1960 and 1961.
[2]Unavailable.

TABLE 11: — Summary of Gross Construction Additions — All Other Additions — of 404 Independent Telephone Companies Reporting To T. E. & M.'s Research Department[1]

States	All Other Construction Additions[1] 1959	1960	1961
Ala.	$ 74,496	$ 31,126	$ 30,636
Alaska	8,225	30,497	43,381
Ariz.[2]	—	—	—
Ark.	12,287	21,547	55,500
Calif.	2,909,634	2,367,539	1,677,225
Colo.	36,643	2,500	23,745
Fla.	1,070,843	1,784,910	1,563,000
Ga.	58,310	25,637	27,500
Hawaii	392,345	464,000	426,000
Idaho	9,115	7,038	11,000
Ill.	675,103	703,611	760,511
Ind.	443,998	703,445	523,345
Ia.	110,069	205,128	83,500
Kans.	195,883	136,768	429,848
Ky.	255,720	193,000	286,000
La.	6,266	5,948	8,000
Maine	35,274	19,467	35,500
Mich.	50,374	28,635	50,200
Minn.	84,623	72,726	36,200
Miss.[2]	—	—	—
Mo.	802,102	984,400	1,040,561
Mont.	25,498	13,500	21,500
Neb.	179,708	120,554	210,751
N. Mex.	7,132	3,132	4,000
Nev.	174,167	124,028	83,800
N. Y.	680,405	609,478	841,300
N. C.	291,948	306,652	310,500
N. D.	142,771	63,033	34,000
Ohio	369,916	448,856	340,500
Okla.	44,956	12,517	17,000
Ore.	19,882	15,096	48,315
Pa.	724,664	731,338	787,400
S. C.	34,069	40,963	49,000
S. D.	40,136	64,126	14,085
Tenn.	111,656	101,846	158,870
Texas	1,450,645	1,716,329	1,651,729
Utah[2]	—	—	—
Vt.	9,600	3,342	5,000
Va.	225,621	218,222	285,814
Wash.	439,810	686,400	789,970
W. Va.	—	3,000	94,000
Wisc.	638,612	413,516	1,132,688
Wyo.	8,401	4,000	—
Totals	$12,850,907	$13,487,850	$13,991,874

[1]Actual for 1959; estimated by reporting companies for 1960 and 1961.
[2]Unavailable.

TABLE 12: — Summary Of Total Construction Additions Of 404 Independent Telephone Companies Reporting To T. E. & M.'s Research Department For 1959, 1960, & 1961[1]

States	Total Construction Additions[1] 1959	1960	1961
Ala.	$ 1,768,007	$ 873,805	$ 1,355,211
Alaska	3,157,260	1,057,487	1,165,721
Ariz.[2]	—	—	—
Ark.	207,374	967,507	1,315,660
Calif.	81,779,526	75,982,712	72,622,521
Colo.	523,398	90,817	397,518
Fla.	30,423,628	38,527,009	45,836,921
Ga.	728,879	701,859	1,507,120
Hawaii	10,696,941	14,767,000	16,993,900
Idaho	203,760	242,053	229,415
Ill.	14,125,188	19,144,808	25,379,332
Ind.	18,206,545	18,773,496	18,753,201
Ia.	1,932,564	2,576,329	1,939,260
Kans.	1,622,592	2,432,148	3,099,120
Ky.	7,827,684	7,948,500	4,649,520
La.	501,880	157,036	199,500
Maine	692,173	409,401	257,600
Mich.	1,231,315	408,398	1,368,480
Minn.	841,333	1,965,020	1,496,950
Miss.	35,545	658,245	46,971
Mo.	24,324,685	29,861,130	31,076,454
Mont.	725,029	1,201,780	1,048,470
Neb.	7,034,944	6,363,020	6,617,354
N. Mex.	96,348	77,864	91,000
Nev.	4,910,474	4,148,975	5,337,217
N. Y.	18,368,747	19,394,483	22,041,150
N. C.	8,863,436	11,246,244	12,516,891
N. D.	3,676,637	2,454,219	1,229,006
Ohio	8,710,326	8,796,828	8,831,676
Okla.	1,148,749	1,222,611	1,785,320
Ore.	555,761	1,019,289	885,436
Pa.	14,068,617	17,413,051	16,919,859
S. C.	538,041	979,156	918,500
S. D.	2,526,135	770,853	651,998
Tenn.	6,962,507	4,429,791	4,794,370
Texas	21,227,389	25,319,171	33,627,324
Utah[2]	—	—	—
Vt.	73,105	91,547	199,500
Va.	4,773,460	4,006,890	5,022,261
Wash.	14,605,154	15,648,544	16,940,180
W. Va.	20,400	72,000	527,000
Wisc.	11,686,931	9,979,105	16,330,827
Wyo.	182,961	98,000	312,500
Totals	$331,585,428	$352,278,181	$386,318,214

[1]Actual for 1959; estimated by reporting companies for 1960 and 1961.
[2]Unavailable.

by 13 Bell System associated companies and one Independent, calls for construction of 1044 broad-band channel groups, 258 type ON four-channel carrier telephone systems, six type N 12-channel carrier telephone systems, one program channel system, and 1137 voice frequency carrier telegraph channels.

2,800,000 Channel Miles Of Facilities To Be Added

FACILITIES proposed will provide about 2,800,000 telephone channel miles of facilities for message and private line services, and about 1,300,000 telegraph channel miles for use in private line telegraph and teletypewriter exchange service.

Noting that there were 62,000 message telephone circuits in the AT&T national layout on Oct. 1, 1960, a figure that was expected to rise to 64,000 by the end of 1960 and 66,000 by mid-1961, under authorizations already issued by the Commission, Long Lines said that a total of 73,000 message circuits will be available after construction outlined in the application. The private line and TWX facilities proposed will be sufficient to care for anticipated traffic "for about a one-year period," it was added in the Long Lines filing.

Long Lines said that telephone message traffic along principal AT&T routes "has continued its upward trend, with an overall increase of about 9% expected for 1960 over 1959. Circuit additions for 1961, as covered by the application, are based on an expected continuation of this rate of growth and include some additional circuits to provide an improved grade of service necessitated by the further conditioning of the network for direct distance dialing."

TWX Circuits

DISCUSSING TWX, Long Lines Chief Engineer James R. Rae said in the application that TWX traffic in the peak month of 1960 was expected to increase about 10% over the peak month of 1959. Average business day messages during the peak month of 1960 were expected to reach about 106,000 and about 116,000 messages in the peak month of 1961. About 6400 TWX circuits were expected to be available upon completion of the 1960 program, and the proposed 1961 program includes about 700 additional circuits to make a total of 7100. Private line telegraph service was expected to increase about 9% in 1960 over 1959, and a similar increase is expected for 1961.

"About 5000 voice frequency carrier telegraph terminals were authorized under the 1960 blanket application," Long Lines continued. "Approximately 1550 terminals for 1961 are included herein, to make a total of about 84,500 terminals in the plant. The telegraph terminal additions have been held to a minimum in anticipation of the mechanization of the TWX network, tentatively planned for the latter part of 1962. This will later release a substantial number of carrier telegraph terminals for private line use. Some of the additional 700 TWX circuits being added are to establish new direct circuit groups to reduce the switching load, thereby saving the installation of new switch-board positions which will not be required after TWX is mechanized. The additional carrier telegraph channel terminals included in this application, together with the reuse of existing term-

TABLE 13: — Total Communications Plant In Service of 404 Independent Telephone Companies Reporting To T.E.&M.'s Research Department For 1959, 1960, and 1961[1]

States	Communications Plant In Service[1] 1959	1960	1961
Ala.	$ 5,753,107	$ 6,859,415	$ 8,092,186
Alaska	11,984,592	12,963,638	14,089,534
Ariz.	3,533,028	4,489,079	6,065,276
Ark.	6,551,419	8,056,858	8,745,383
Calif.	532,325,000	611,198,000	673,400,000
Colo.	1,634,350	1,705,167	2,101,685
Fla.	205,663,000	236,249,000	278,203,000
Ga.	4,571,818	5,311,852	6,765,741
Hawaii	76,506,000	89,334,000	103,624,000
Idaho	2,460,382	2,690,581	2,910,296
Ill.	128,057,000	143,463,000	163,808,000
Ind.	142,528,000	157,826,000	170,120,000
Ia.	13,481,000	15,826,000	17,576,000
Kans.	13,361,000	15,715,000	18,722,000
Ky.	44,518,000	51,958,000	55,973,000
La.	3,011,000	3,163,000	3,352,000
Maine	2,711,000	2,985,000	3,201,000
Mich.	5,692,000	6,048,000	7,260,000
Minn.	21,670,000	22,634,000	24,283,000
Miss.	1,204,000	1,672,000	1,700,000
Mo.	187,839,000	209,870,000	234,860,000
Mont.	7,377,000	8,882,000	10,075,000
Nebr.	40,118,000	45,707,000	50,934,000
N. Mex.	520,000	592,000	683,000
Nev.	19,634,000	23,109,000	28,460,000
N. Y.	136,694,000	151,402,000	168,669,000
N. C.	110,094,000	119,323,000	129,576,000
N. D.	18,109,000	21,304,000	22,734,000
Ohio	88,594,000	96,640,000	104,769,000
Okla.	7,414,000	8,027,000	9,147,000
Ore.	5,516,000	6,497,000	7,276,000
Pa.	137,971,000	151,027,000	164,231,000
S. C.	4,765,000	5,706,000	6,559,000
S. D.	8,075,000	8,706,000	9,115,000
Tenn.	37,858,000	41,573,000	44,496,000
Texas	157,129,000	180,859,000	204,400,000
Utah	822,000	1,056,000	1,335,000
Vt.	1,229,000	1,293,000	1,462,000
Va.	32,035,000	35,282,000	39,388,000
Wash.	99,173,000	112,061,000	124,896,000
W. Va.	647,000	718,000	1,149,000
Wisc.	69,272,000	77,524,000	90,979,000
Wyo.	428,000	480,000	644,000
Totals	**$2,398,578,696**	**$2,707,785,590**	**$3,025,829,101**

[1]Actual for 1959; estimated by reporting companies for 1960 and 1961.

[2]Unavailable.

inals, will provide approximately 1100 carrier telegraph channels."

The application calls for conversion of coaxials in existing routes to the new L-3 operation in the Dallas-Jackson, Indianapolis-Louisville, Augusta-Jacksonville, and Airmont, N. Y.-New York cables.

New radio relay additions proposed include a new route between Harrisburg, Frederick, and Silver Spring, Md., to connect the new "hardened" coaxial cable to the Washington area for message telephone and private line growth; initial "interstitial" channels between Orlando and West Palm Beach, Fla.; and initial use of the Salt Lake City-Turquoise, Calif., route for message telephone circuits.

REA's Telephone Program

IN REA'S telephone program, the number of subscribers who have benefited from REA loans passed the one million mark during 1960. The number of companies and cooperatives obtaining telephone loans increased to 727 borrowers in 45 States in 1960. Practically all the service provided through REA loans is modern dial.

In 1960, telephone loans approved by REA amounted to $106.9 million, and funds advanced to telephone borrowers by REA totaled $105 million. There were 48 new borrowers in 1960, raising the total number to 727. Total loans to date to all borrowers came to $737 million.

Of these REA telephone borrowers, 515 are commercial companies and 212 are cooperatives. Loans approved in 1960 will provide new or improved service for 190,000 subscribers, bringing to 1,470,000 the number of subscribers who will benefit.

During 1960, telephone borrowers paid $16.2 million in principal and interest, including an increase of more than $1.5 million in the amount paid ahead of schedule. Since 1949, when Congress authorized the telephone program, borrowers have repaid approximately $25.3 million of principal including a balance of $4 million in the amount paid in advance of due dates. They have also paid $19.6 million in interest. Only 11 telephone borrowers were delinquent in payments amounting to $311,570.

TABLE 14:— Summary of Annual Gross Operating Revenues of 404 Independent Telephone Companies Reporting To T.E.&M.'s Research Department, 1959, 1960, and 1961[1]

States	Annual Gross Operating Revenues[1] 1959	1960	1961
Ala.	$ 1,184,141	$ 1,335,565	$ 1,440,723
Alaska	2,459,191	2,706,245	2,907,244
Ariz.	813,153	1,005,060	1,202,455
Ark.	1,785,475	1,981,314	2,109,964
Calif.	146,397,000	163,855,000	181,837,000
Colo.	275,355	333,861	425,000
Fla.	55,514,000	59,177,000	67,387,000
Ga.	829,527	1,033,096	1,173,573
Hawaii	21,565,000	24,877,000	27,399,000
Idaho	425,116	466,030	491,968
Ill.	39,269,000	44,270,000	47,558,000
Ind.	39,818,000	44,620,000	47,991,000
Ia.	3,567,000	3,985,000	4,448,000
Kans.	1,803,000	2,073,000	2,379,000
Ky.	12,450,000	13,521,000	14,364,000
La.	536,000	600,000	631,000
Maine	497,000	576,000	601,000
Mich.	1,330,000	1,545,000	1,634,000
Minn.	4,693,000	5,278,000	5,812,000
Miss.	154,000	177,000	214,000
Mo.	43,650,000	48,397,000	53,726,000
Mont.	1,252,000	1,343,000	1,626,000
Neb.	11,080,000	12,211,000	13,201,000
N. Mex.	204,000	234,000	255,000
Nev.	6,255,000	7,940,000	9,199,000
N. Y.	38,792,000	41,797,000	45,482,000
N. C.	27,931,000	30,401,000	33,459,000
N. D.	2,312,000	2,809,000	3,061,000
Ohio	23,447,000	25,202,000	26,537,000
Okla.	1,513,000	1,900,000	2,200,000
Ore.	1,130,000	1,258,000	1,487,000
Pa.	32,765,000	36,122,000	37,965,000
S. C.	1,498,000	1,644,000	1,799,000
S. D.	843,000	987,000	1,234,000
Tenn.	9,024,000	9,996,000	10,769,000
Texas	44,565,000	48,560,000	53,466,000
Utah	219,000	301,000	397,000
Vt.	361,000	376,000	387,000
Va.	8,520,000	9,514,000	10,374,000
Wash.	28,051,000	31,313,000	33,505,000
W. Va.	137,000	148,000	283,000
Wis.	18,712,000	21,029,000	23,480,000
Wyo.	107,000	120,000	161,000
Totals	$637,732,958	$707,017,171	$776,058,927

[1]Actual for 1969; estimated by reporting companies for 1960 and 1961.

Communications Equipment Manufacturing Industry

THE domestic and foreign sales of the Communications Equipment Manufacturing Industry for 1960 amounted to $2.93 billion, another record all-time high, slightly over the prediction originally anticipated in a report issued in 1960 by the Business and Defense Services Administration, U. S. Department of Commerce.

The upward trend in the communications equipment manufacturing industry picked up rapidly in 1959, regaining volume lost during the 1958 adjustment, and 1960 production of the industry was approximately 10 percent higher than the previous year.

The following tabulation, derived from industry statistical reports, shows production sales in billion dollars for the following years:

	1958	1959	*1960
Total sales	$2.48	$2.65	$2.93

*Estimated

About 30 percent of the sales were to the Government for equipment related mainly to defense projects.

The industry spent well over $1 billion during 1960 for materials and supplies, not manufactured by them,

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Growth of U. S. Population 1950-1960, and Telephones January 1, 1950 — January 1, 1960

While the nation's population increased 18.5%, telephones in the U.S.A. increased 73.5%

States	Population[1]			Total Telephones[2]			
	1960	1950	% Inc.	1-1-60	1-1-50	Increase	% Inc.
Ala.	3,266,740	3,061,743	6.7	831,800	396,714	435,086	109.7
Alaska	226,167	128,643	75.8	38,800	12,600	26,200	207.9
Ariz.	1,302,161	749,587	73.7	405,200	148,878	256,322	172.2
Ark.	1,786,272	1,909,511	—6.5	412,700	241,891	170,809	70.6
Calif.	15,717,204	10,586,223	48.5	7,364,100	3,589,168	3,774,932	105.1
Colo.	1,753,947	1,325,089	32.4	756,900	413,893	343,007	82.9
Conn.	2,535,234	2,007,280	26.3	1,246,200	745,183	501,017	67.2
Del.	446,292	318,085	40.3	209,300	109,486	99,814	91.1
D. C.	763,956	802,178	—4.8	621,300	466,631	154,669	33.1
Fla.	4,951,560	2,771,305	78.7	1,852,000	601,683	1,250,317	207.8
Ga.	3,943,116	3,444,578	14.5	1,154,800	541,636	613,164	113.1
Hawaii	632,772	499,794	26.6	222,300	94,600	127,700	135.0
Idaho	667,191	588,637	13.3	218,400	132,045	86,355	65.4
Ill.	10,081,158	8,712,176	15.7	4,541,400	2,935,928	1,605,472	54.7
Ind.	4,662,498	3,934,224	18.5	1,737,900	1,088,787	649,113	59.6
Ia.	2,757,537	2,621,073	5.2	1,088,300	796,823	291,477	36.6
Kans.	2,178,611	1,905,299	14.3	874,800	569,890	304,910	53.5
Ky.	3,038,156	2,944,806	3.2	796,200	442,542	353,658	79.9
La.	3,257,022	2,683,516	21.4	1,021,800	475,242	546,558	115.0
Me.	969,265	913,774	6.1	306,500	226,673	79,827	35.2
Md.	3,100,689	2,343,001	32.3	1,254,600	620,881	633,719	102.1
Mass.	5,148,578	4,690,514	9.8	2,275,400	1,529,490	745,910	48.8
Mich.	7,823,194	6,371,766	22.8	3,211,600	1,933,922	1,277,678	66.1
Minn.	3,413,864	2,982,483	14.5	1,335,400	873,994	461,406	52.8
Miss.	2,178,141	2,178,914	—	423,500	210,576	212,924	101.1
Mo.	4,319,813	3,954,653	9.2	1,692,600	1,109,111	583,489	52.6
Mont.	674,767	591,024	14.2	243,200	135,014	108,186	80.1
Neb.	1,411,330	1,325,510	6.5	564,800	384,334	180,466	47.0
Nev.	285,278	160,083	78.2	114,900	47,021	67,879	144.4
N. H.	606,921	533,242	13.8	214,200	148,923	65,277	43.8
N. J.	6,066,782	4,835,329	25.5	2,835,000	1,542,827	1,292,173	83.8
N. Mex.	951,023	681,187	39.6	279,300	105,970	173,330	163.6
N. Y.	16,782,304	14,830,192	13.2	8,477,300	5,168,201	3,309,099	64.0
N. C.	4,556,155	4,061,929	12.2	1,110,000	507,053	602,947	118.9
N. D.	632,446	619,636	2.1	190,700	119,381	71,319	59.7
Ohio	9,706,397	7,946,627	22.1	3,946,300	2,476,726	1,469,574	59.3
Okla.	2,328,284	2,233,351	4.3	865,700	545,252	320,448	58.8
Ore.	1,768,687	1,521,341	16.3	688,800	412,856	275,944	66.8
Pa.	11,319,366	10,498,012	7.8	4,919,700	2,969.690	1,950,010	65.7
R. I.	859,488	791,896	8.5	337,500	233,734	103,766	44.4
S. C.	2,382,594	2,117,027	12.5	537,300	228,818	308,482	134.8
S. D.	680,514	652,740	4.3	219,400	148,376	71,024	47.9
Tenn.	3,567,089	3,291,718	8.4	1,072,800	605,879	466,921	77.1
Texas	9,579,677	7,711,194	24.2	3,305,600	1,710,954	1,594,646	93.2
Utah	890,627	688,862	29.3	345,900	187,742	158,158	84.2
Vt.	389,881	377,747	3.2	127,200	95,358	31,842	33.4
Va.	3,966,949	3,318,680	19.5	1,242,900	649,487	593,413	91.4
Wash.	2,853,214	2,378,963	19.9	1,160,900	721,779	439,121	60.8
W. Va.	1,860,421	2,005,552	—7.2	514,700	343,481	171,219	49.8
Wis.	3,951,777	3,434,575	15.1	1,484,800	946,996	537,804	56.8
Wyo.	330,066	290,529	13.6	126,200	72,479	53,721	74.1
TOTALS	179,323,175	151,325,798	18.5	70,818,900	40,816,598	30,002,302	73.5

[1]Source, U. S. Census Reports. Although Alaska and Hawaii were not states in 1950, the Census bureau includes their population figures. Census totals do not include American citizens or military personnel living abroad, crews of American ships away from ports, or residents of American possessions such as Puerto Rico and the Virgin Islands.

[2]Source, Telephone Development Census of December 31, 1949. To permit comparisons of 1950 with 1960, telephones in Alaska (12,600) and Hawaii (95,600) have been included in the 1950 figures.

Compiled by Research Department of "Telephone Engineer & Management."

from about 40,000 suppliers located in more than 3,000 towns or cities across the nation. About 90 percent of the suppliers are in the so-called small business category. Consequently, many small businesses are dependent upon the economic health of the communications industry.

Considerable monies are being appropriated to expand research laboratories that provide and develop new techniques, create new manufacturing methods, and design new equipment. New tools, new plastics and textiles, new alloys, finishes, and automation originally developed by the communications industry, are being accepted by other industries.

The science of communications, in common with other major industries benefiting from American technology, thrives on the interchange of ideas, inventions, developments, and skills. In this connection, transistors, diodes, and masers represent major breakthroughs which should revolutionize the equipment, production, and the

Increase In Bell System and Independent Phones Jan. 1, 1950 — Jan. 1, 1960

	Bell System Phones[1]				Independent Phones[2]			
States	Jan. 1, 1950	Jan. 1, 1960	Increase	% Inc.	Jan. 1, 1950	Jan. 1, 1960	Increase	% Inc.
Ala.	359,771	735,400	375,629	104.4	36,943	96,400	59,457	160.9
Alaska	—	—	—	—	12,600	38,800	26,200	207.9
Ariz.	145,329	397,600	252,271	173.6	3,549	7,600	4,051	114.1
Ark.	193,894	313,500	119,606	61.7	47,997	99,200	51,203	106.7
Calif.	3,096,079	6,000,300	2,904,221	93.8	493,089	1,363,800	870,711	176.6
Colo.	405,103	744,100	338,997	83.7	8,790	12,800	4,010	45.6
Conn.	742,535	1,239,700	497,165	67.0	2,648	6,500	3,852	145.5
Dela.	109,486	209,300	99,814	91.2	—	—	—	—
Dist. of Col.	466,631	621,300	154,669	33.1	—	—	—	—
Fla.	412,408	1,278,000	865,592	209.9	189,275	574,000	384,725	203.3
Ga.	487,082	1,010,400	523,318	107.4	54,554	144,400	89,846	164.7
Hawaii	—	—	—	—	94,600	222,300	127,700	135.0
Idaho	104,564	175,400	70,836	67.7	27,481	43,000	15,519	56.5
Ill.	2,464,006	3,854,300	1,390,294	56.4	471,922	687,100	215,178	45.6
Ind.	642,641	1,138,800	496,159	77.2	446,146	599,100	152,954	34.3
Ia.	484,753	732,800	248,047	51.2	312,070	355,500	43,430	13.9
Kans.	413,504	712,000	298,496	72.2	156,386	162,800	6,414	4.1
Ky.	355,296	613,800	258,504	72.8	87,246	182,400	95,154	10.9
La.	459,225	973,900	514,675	112.1	16,017	47,900	31,883	199.1
Me.	205,697	278,900	73,203	35.6	20,976	27,600	6,624	31.6
Md.	619,826	1,253,200	633,374	102.2	1,055	1,400	345	32.7
Mass.	1,528,698	2,274,000	745,302	48.8	792	1,400	608	76.8
Mich.	1,760,202	2,891,600	1,131,398	64.3	173,720	320,000	146,280	84.2
Minn.	683,549	1,077,400	393,851	57.6	190,445	258,000	67,555	35.5
Miss.	205,234	409,600	204,366	99.6	5,342	13,900	8,558	160.2
Mo.	844,040	1,425,200	581,160	68.9	265,071	267,400	2,329	8.8
Mont.	121,522	209,000	87,478	72.0	13,492	34,200	20,708	153.5
Neb.	194,220	312,300	118,080	60.8	190,114	252,500	62,386	32.8
Nev.	27,836	53,500	25,664	92.2	19,185	61,400	42,215	220.0
N. H.	141,182	204,300	63,118	44.7	7,741	9,900	2,159	27.9
N. J.	1,525,017	2,794,100	1,269,083	83.2	17,810	40,900	23,090	129.6
N. M.	94,702	243,000	148,298	156.6	11,268	36,300	25,032	222.2
N. Y.	4,806,855	7,894,500	3,087,645	64.2	361,346	582,800	221,454	61.3
N. C.	291,898	619,600	327,702	112.3	215,155	490,400	275,245	127.9
N. D.	82,391	135,300	52,909	64.2	36,990	55,400	18,410	49.8
Ohio	1,951,630	3,100,800	1,149,170	58.9	525,096	845,500	320,404	61.0
Okla.	472,708	773,900	301,192	63.7	72,544	91,800	19,256	26.5
Ore.	344,364	553,500	209,136	60.7	68,492	135,300	66,808	97.5
Pa.	2,560,871	4,146,600	1,585,729	61.9	408,819	773,100	364,281	89.1
R. I.	229,157	329,100	99,943	43.6	4,577	8,400	3,823	83.5
S. C.	183,018	415,700	232,682	127.1	45,800	121,600	75,800	165.5
S. D.	115,784	177,900	62,116	53.6	32,592	41,500	8,908	27.3
Tenn.	535,056	932,000	396,944	74.2	70,823	140,800	69,977	98.8
Texas	1,444,199	2,791,000	1,346,801	93.3	266,755	514,600	247,845	92.9
Utah	182,503	333,200	150,697	82.6	5,239	12,700	7,461	142.4
Vt.	83,090	112,100	29,010	34.9	12,268	15,100	2,832	23.1
Va.	543,173	1,009,000	465,827	85.8	106,314	233,900	127,586	120.0
Wash.	601,471	931,600	330,129	54.9	120,308	229,300	108,992	90.6
W. Va.	304,156	457,200	153,044	50.3	39,325	57,500	18,175	46.2
Wis.	682,071	1,101,800	419,729	61.5	264,925	383,000	118,075	44.6
Wyo.	67,783	118,700	50,917	75.1	4,696	7,500	2,804	59.7
Total U. S.	34,776,210	60,110,200	25,333,990	72.8	6,040,388	10,708,700	4,668,312	77.3
Puerto Rico	—	—	—	—	34,800	76,000	41,200	118.4
Total	34,776,210	60,110,200	25,333,990	72.8	6,075,188	10,784,700	4,709,512	77.5

1 2 Source, Telephone Development Census of December 31, 1949. To permit comparisons of 1950 with 1960, telephones in Alaska (12,600), Hawaii (94,600) and Puerto Rico (34,800) have been included in the 1950 figures. 1960 figures for the Bell System supplied by the A. T. & T. Co. 1960 figures for the Independent Telephone Industry supplied by A.T. & T. Co.

Growth in Telephones — U.S.A.[1] and Puerto Rico[2] 1950-1959 (000 Omitted)

Year Ended (Dec. 31)	Bell Telephone System Telephones	Increase During Yr.	% Inc.	Independent Telephone Companies Telephones	Increase During Yr.	% Inc.	Total Bell & Independents Telephones	Increase During Yr.	% Inc.
1950	36,796	2,020	5.8	6,374	288	4.7	43,170	2,308	5.6
1951	38,942	2,146	5.8	6,880	506	7.9	45,822	2,652	6.1
1952	41,015	2,073	5.3	7,240	360	5.2	48,255	2,433	5.3
1953	43,010	1,995	4.9	7,577	337	4.7	50,587	2,332	4.8
1954	45,044	2,034	4.7	7,996	419	5.5	53,040	2,453	4.8
1955	48,029	2,985	6.6	8,461	465	5.8	56,490	3,450	6.5
1956	51,343	3,314	6.9	9,112	651	7.7	60,455	3,965	7.0
1957	54,241	2,898	5.6	9,672	560	6.1	63,913	3,458	5.7
1958	56,759	2,518	4.6	10,185	513	5.3	66,944	3,031	4.7
1959	60,110	3,351	5.9	10,785	600	5.9	70,895	3,951	5.9

[1]Figures on telephones of the Bell System and the Independent Telephone Companies for 1950 through 1959 were adapted for this report from data presented in the "1960 Annual Statistical Volume of The United States Independent Telephone Association For the Year 1959." Copyright 1960, United States Independent Telephone Association, Washington, D. C.

[2]Puerto Rico included in totals for the Independent Telephone Industry

Growth In Telephone Plant Investment[1] U.S.A. and Puerto Rico[2] 1950-1959 ($000 Omitted)

Year	Bell Telephone System Total Plant Investment[1]	Increase During Year	% Inc.	Independent Telephone Companies Total Plant Investment[1]	Increase During Year	% Inc.	Total Bell & Independents Total Plant Investment[1]	Increase During Year	% Inc.
1950	$10,415,335	$ 688,800	7.1	$1,096,100	$134,901	14.0	$11,511,435	$ 823,701	7.7
1951	11,291,837	876,502	8.4	1,252,740	156,640	14.3	12,544,577	1,033,142	9.0
1952	12,353,284	1,061,447	9.4	1,424,940	172,200	13.7	13,778,224	1,233,647	9.8
1953	13,461,950	1,108,666	9.0	1,604,480	179,540	12.6	15,066,430	1,288,206	9.3
1954	14,567,746	1,105,796	8.2	1,813,480	209,000	13.0	16,381,226	1,314,796	8.7
1955	15,799,247	1,231,501	8.5	2,042,820	229,340	12.6	17,842,067	1,460,841	8.9
1956	17,555,590	1,756,343	11.1	2,373,650	330,830	16.2	19,929,240	2,087,173	11.7
1957	19,681,340	2,125,750	12.1	2,801,400	427,750	18.0	22,482,740	2,553,500	12.8
1958	21,253,378	1,572,038	8.0	3,187,050	385,650	13.8	24,440,428	1,957,688	8.7
1959	22,847,768	1,594,390	7.5	3,580,369	393,319	12.3	26,428,137	1,987,709	8.1

[1]Figures on total plant investment for the Bell Telephone System and the Independent Telephone Companies for 1950 through 1959 were adapted for this report from data presented in the "1960 Annual Statistical Volume of The United States Independent Telephone Association For The Year 1959." Copyright 1960, United States Independent Telephone Association, Washington, D. C.

[2]Puerto Rico included in totals for Independent Telephone Companies.

Growth In Telephone Operating Revenues[1] U.S.A. and Puerto Rico[2] 1950-1959 ($000 Omitted)

Year	Bell Telephone System Total Operating Revenues	Increase During Year	% Inc.	Independent Telephone Companies Total Operating Revenues	Increase During Year	% Inc.	Total Bell & Independents Total Operating Revenues	Increase During Year	% Inc.
1950	$3,345,108	$374,418	12.6	$316,820	$ 30,248	10.6	$3,661,928	$404,666	12.4
1951	3,733,218	388,110	11.6	366,668	49,848	15.7	4,099,886	437,958	11.9
1952	4,141,360	408,142	10.9	415,894	49,226	13.4	4,557,254	457,368	11.2
1953	4,529,787	388,427	9.4	486,030	70,136	16.8	5,015,817	458,563	10.1
1954	4,907,481	377,694	8.3	535,260	49,230	10.1	5,442,741	426,924	8.5
1955	5,425,442	517,961	10.6	590,150	54,890	10.3	6,015,592	572,851	10.5
1956	5,966,190	540,748	10.0	663,650	73,500	12.5	6,629,840	614,248	10.2
1957	6,467,583	501,393	8.4	733,150	69,500	10.5	7,200,733	570,893	8.6
1958	6,937,916	470,333	7.3	808,800	75,650	10.3	7,746,716	545,983	7.6
1959	7,571,536	633,620	9.1	915,189	106,389	13.1	8,486,725	740,009	9.6

[1]Figures on total operating revenues for the Bell Telephone System and the Independent Telephone Companies for 1950 through 1959 were adapted for this report from data presented in the "1960 Annual Statistical Volume of The United States Independent Telephone Association For The Year 1959." Copyright 1960, United States Independent Telephone Association, Washington, D. C.

[2]Puerto Rico included in totals for Independent Telephone Industry.

handling of communications.

Employment rose again during 1960 to about 188,000 workers, who received a total of over $1 billion. The following tabulation shows the employment situation in the communications equipment manufacturing industry:

	1958	1959	1960
Bell Manufacturers	133,800	141,300	145,000
Non-Bell Manufacturers	29,200	32,200	43,000
Total	163,000	173,500	188,000

The level of exports and imports of the communications equipment is relatively low compared with domestic consumption. However, an upward trend in the industry export sales is expected since the National Export Expansion Program was inaugurated.

The following tabulation, derived from Quarterly Production Reports, shows the principal items of equipment manufactured by the industry for the years 1958, 1959, 1960:

Product	Unit of Measure	Quantity 1958	1959	1960*
Telephones	Sets	7,005,915	8,584,273	8,841,995
Dial C. O. Equip.	Lines	3,177,635	3,354,076	4,098,150
Dial PAX Equip.	Lines	463,322	601,098	776,624
Manual C. O. Equip.	Positions	4,719	6,855	4,015
Manual PBX Equip.	Positions	8,882	12,471	8,580
Ringing Machines	Units	19,387	22,018	26,400
Repeater Equip. (Voice and Telegraph)	Repeaters	362,016	338,623	372,500
Intercommunications Equip.	Stations	11,647	23,036	24,600
Telegraph Station Equip.	Instruments	50,921	35,186	62,300
Protectors	Units (M)	3,438.2	3,561.7	3,700
Cable Terminals	Units	940,178	1,193,451	1,300,000
Telephone Booths, Metal	Booths	26,431	22,977	28,000

* 4th Quarter estimated

The major communications equipment manufacturers are located principally in New York, Illinois, Ohio and California. For the past few years the industry's plant construction programs have expanded, and as a result many buildings have been erected in various states in non-target areas. The industry has more than 50 material and supply warehouses or distributing houses throughout the country for servicing the operating telephone companies. During an emergency or mobilization period, these locations would permit immediate access to vital supplies.

The equipment produced by the manufacturing segment of the communications industry covers a wide variety of highly complex switching and transmission items to meet the manifold requirements of the domestic operating telephone, telegraph, and international radio and cable companies. More than one quarter million different components and parts are now manufactured for the numerous types of communications services offered to the public by communications operating companies.

The communications manufacturers are producing complex electronic control equipment for the NIKE guided missile systems. The industry also constructed the DEW line (Distant Early Warning radar line), located in the Arctic along the northern edge of the continent. The nation's defense against invading aircraft is further integrated by the SAGE system, in which this industry is playing an important part.

The communications industry in 1959 assumed the responsibility as leader of an industrial team in SPACE to prepare a globe-girdling communications tracking and data network in support of Project Mercury, America's effort to put man into space.

With the growth of various forms of automation, electronic computers and other automatic control devices, standards with respect to speed and accuracy have changed. This situation is largely a result of a new method of handling information, the central data-processing concept. This system just recently has been made available to the public.

The products involve the use of practically all known materials and skills, plus extremely exacting manufacturing standards. Under full mobilization, the industry would divert a considerable amount of its production capacity to manufacturing similar products for the Armed Forces. In the midst of international tensions, the communications industry would continue to make its facilities available to the Government.

Telephone Industry Must Grow At A Fast Pace

THE NET result of our analysis of the reports on the operations of (1) over 400 telephone companies for 1959 and 1960 and their estimates for 1961, (2) data on the Bell System, and (3) statistics on communication equipment manufacturers, is: *The telephone industry cannot help growing at a fast pace.*

Barring any debacle like the 1932 depression, we believe the telephone industry is today favored by the following factors that were negligible in the '30's;

(1) The U. S. Population is increasing at the rate of one person every 11 seconds and should reach 215,000,000 by 1970. During the 10-year period from January 1, 1950 to January 1, 1960 the U. S. population increased from 151,325,798 to 179,323,175, or 18.5 percent. During the same period telephones in the U.S.A. jumped from 40,816,598 to 70,818,900 for a gain of 73.5 percent. (*See tables on pages 43, 44 of this issue.*)

(2) More people have the means to buy both basic telephone service, and service arrangements that meet their individual needs and tastes. Annual family income which has risen from $4,600 in 1947 to $5,600 in 1958 is expected to be $6,800 in 1970 (after taxes and in dollars at their 1957 value.)

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Washington And The Industry In '61

YOU AND WASHINGTON IN 1961

• Regardless of international crisis (short of a shooting war involving the U. S. A.), the tenor of the new administration, and similar aspects over which the telephone industry has no control, the future of the industry, from a Washington legislative and regulatory point of view, in a considerable measure will be shaped by the industry itself.

By FRED HENCK*

WHEN the possibility of doing this article was first broached to the author several months ago, his suggestion was that any definite discussions be deferred until after the Presidential election, the annual convention of the National Association of Railroad & Utilities Commissioners, and the filing of the wide area telephone service tariff, among other things.

From a safe distance, before the fact, it appeared that the outlines of 1961's impact on the telephone industry would become much clearer after the identity of the next President was known, appointments to top federal posts were made, and some anticipated regulatory developments had a chance to do their developing.

Well, the time has come and gone, and most of these things have happened, but no bells have rung, no light have flashed, and no clear visions of the future have miraculously appeared.

Instead, we have had another lesson in a fact of life which slowly sinks in on most people — even those in Washington. Miracles don't happen. Events don't materialize out of nowhere solely as the result of external forces. Instead, the day-by-day progress of all activities, including the telephone industry, is shaped by the patient, hard, enlightened struggles of people who meet the effects of external forces as they occur, and bend their own efforts to the conditions they find.

Mr. Henck is executive editor of "Telecommunications Reports," Washington, D. C., and a member of TE&M's Washington staff.

All of this is by way of saying that regardless of international crisis (short of a shooting war involving the United States), the tenor of the new administration, and similar aspects over which the telephone industry has no control, the future of the industry in 1961 from a Washington legislative and regulatory point of view in considerable measure will be shaped by the industry itself.

Always excluding that international explosion — not the almost certain periods of high tension and uncertainty, but the actual holocaust — the external forces do not look particularly unfavorable, viewed from the Washington end of the country.

Take, for example, certain essential elements of the domestic picture:

The Kennedy Administration: — Mr. Kennedy's early actions, in the first six weeks following the election, have looked good to many of the pre-election Nixon supporters to whom we have talked. His appointment of a largely middle-road, non-doctrinaire top echelon, and the designation of a few Democratic luminaries who might have caused the business community some cause for concern at Cabinet level — i.e., G. Mennen Williams and Chester Bowles — to sub-Cabinet posts has been greeted favorably by many of the observers with whom we are in contact.

In attempting to assess the tenor of the Kennedy administration, there are perhaps four key Cabinet appointments. Two have gone to Republicans, Robert McNamara and Douglas Dillon, giving the first Kennedy Cabinet a

real bipartisan aura. The selection of Dean Rusk as Secretary of State may put Mr. Rusk in a difficult position, when several better-known democrats will be reporting to him in the State organization, but it has been made clear that the new President is not making his appointments on the basis of political payoffs. The designation of Arthur Goldberg as Secretary of Labor has been greeted with general approval — and it is significant that most of the complaints about that appointment of which we are aware have come from organized labor.

The two appointments which appear to be the most criticized are those of Orville Freeman as Secretary of Agriculture and Robert Kennedy as Attorney General. Mr. Freeman, in the opinion of many, is not one of the stronger Cabinet choices, but his selection may reflect the view that the leadership in attempting to solve the nation's knotty farm problems will have to come from Congress. Whether Mr. Kennedy was the best-qualified choice for Attorney General is a much-discussed subject among lawyers, but it seems clear that he is qualified, and there are those who contend that he should not have been denied the post simply because he is Senator Kennedy's brother.

Obviously, any serious attempt to carry out all of the Democratic platform promises would cost more money than the taxpayers could afford — whether or not it totaled the $13 billion figure calculated by Republican sources. It seems to be a fact of our national life, however, that a large percentage of any platform, and the efforts of Presidential candidates to support it, may be dismissed as "campaign oratory." Senator Kennedy's past record does not appear to justify extreme fears of a "far left" administration, in any event.

The closeness of the election results seems, too, to have left its mark on the moves made by Senator Kennedy since the election. While it is true, as pointed out in some quarters, that he is President of all the people, whether elected by one vote or 10,000,000, the difference between mere election and election "with a mandate" has been made evident more than once in our political history.

Even if the tenor of the new administration turned out to be relatively radical, the next item on the list of "external" forces might tend to tone it down a bit.

Congress: — At this point in our national life, the complexion of Congress appears to reflect pretty accurately the national scene — composed of the same people who voted almost 50-50 in the Presidential election.

True, the picture is out of focus from a numerical political party representation point of view, but when it is remembered that the substantial Democratic majorities are made to a large degree of Southerners, who are essentially conservative, it is not far out of focus from a philosophical approach.

The so-called "coalition" of conservative Republicans and Democrats which so frequently dominated past Congresses may not be as powerful as it has been, since during the Eisenhower administration they had merely to muster one more than a third of the vote in either house to sustain a Presidential veto.

But, taking into account not only numbers but influence — particularly the many committee chairmanships held by Southern Democrats — the conservative group appears to carry more than enough weight to stave off most extreme legislation, since much of the remainder of Congress is essentially middle-road.

On the domestic side, one of the biggest legislative battles may come regarding a bill to aid distressed areas — with the conflicts ranging from how one identifies a distressed area to how much the whole package will cost the taxpayers. Another one of these hard facts it is necessary to take into account is that a lot of areas which did not realize they were distressed may suddenly become so identified in their minds, under the impetus of federal money.

Of interest to industry generally, of course, will be the proposal to raise the federal minimum wage to $1.25 an hour. This is the one area of direct interest to the telephone industry with which Senator Kennedy has been personally identified.

What is regarded in many quarters as inevitable — modification or complete abandonment of the exemption for smaller telephone exchanges — may come sooner as the result of Mr. Kennedy's election as President. Operators of telephone companies, however, have long been advised to prepare for this eventuality, which of course becomes less severe in its impact with each dial

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"Modification, or complete abandonment of the Wage-Hour exemption for smaller telephone exchanges may come sooner as the result of Kennedy's election."

The Small Company Job in '61

THE BIG JOB IN 1961

• Many old and familiar problems will confront the small company in 1961. The problems of adequate manpower, adequate rates, increasing labor costs, higher station investment, and the increasing demand for upgraded rural service will be around in '61, just as they have been around for the past few years. But in 1961 Direct Distance Dialing will be the big item, the big problem, and the big opportunity.

By BILL CORMAN*

THE YEAR 1960, and what we did with it, is now history. 1961 is no longer the future, and has become the present. Is this just another year to us small company folks — or is there something special about 1961 at which we should take a long, slow and searching look?

In many ways it is just another year. Without much fear of being contradicted, I can forecast that more small telephone companies will disappear in 1961, just as they have been disappearing for a good many years. All of the factors which have made for this condition in the past are still effective, some of them more so than ever.

Stated in the simplest terms possible, it has been, and still is, getting to be harder and harder to maintain a small telephone operation. While the availability of R.E.A. money, and financing from other industry sources, has largely solved the money problem for small companies, neither REA nor anyone else has solved the gross revenue limitations on the small company. When gross revenue is under certain figures, the company, regardless of how it is financed, simply does not have enough operating money available to pay for the services that are required to maintain a telephone system.

In my opinion, it is only a matter of time until practically all companies with less than 500 stations — and most companies under 1000 — will be absorbed by, or will grow into, larger companies. Another way of saying about the same thing is that I seriously doubt that any telephone company which does not have at least one $10,000 to $20,000 a year man in a management capacity, can continue to exist over a period of time.

In another vein, small companies will still have the problems of adequate manpower, of adequate rates, of increasing labor costs, of higher overall per-station investments, and of the increasing demand for up-graded rural service during 1961, as they have had in the past few years. It is not that I want to give the impression that these are unimportant, for they are not. These problems, and the answers that we provide for them, are fundamental to the future of our business. Each of these problems, viewed from a 1961 vantage point, could well be the subject of innumerable discussions such as this, But these are problems that we have had before, and with your permission I will dismiss them, at least temporarily, and get on to something else.

A "Different" Year

THERE are ways, I believe, in which 1961 will *not* be just another year. This will be true for the entire industry, large company and small company. And one of the ways in which 1961 will be "different" is that, during 1961, for the first time in more than three decades, we will see the widespread advent of a completely new approach to long distance service. In more ways than one, this new approach will have some far reaching

Mr. Corman is manager of the Southland Telephone Co., Atmore, Ala.

effects, and on the small, as well as the large, company.

For several years now "direct distance dialing" and "automatic toll ticketing" have been becoming parts of our telephone language — but up to now DDD has been something that was going to happen — sometime. Of course, in many places, it has already happened, but 1961 will see it become truly widespread.

With an apology to the large company people for passing over their tremendous problems with this new technology so lightly, I will simply say that they have as tough and as expensive a job facing them as I suppose they have ever had, but at least, thank goodness, most of them know it and are well along to doing something about it.

We small company folks have the problem too, perhaps with a difference in emphasis, but I am wondering how many of us realize just what we are running into, headlong and right now.

"Mark Sense Toll Tickets"

IN OUR company, we are beginning to get a hint. In the last several months, we have begun to get chopped down versions of mark sense toll tickets. In an alarming percentage of instances, the ticket is not billable at all. When it is, the billing operator has to pick it up, turn it around, over, upside down and backwards in order to get date, place, code and amount of the call for posting on the toll bill.

I may be thought pessimistic — although I have never before been accused of so being — but I firmly expect this thing to get a lot worse before it starts getting better. I expect to continue to receive an increasing percentage of mark sense toll tickets. I expect to continue to get more and more *different kinds* of such tickets, as more and more companies get into the act. I expect that my toll billing costs, will go up and up until I get mad enough, or smart enough, to do something about it. And I expect that all other small companies will be in exactly the same position.

The small companies that are toll centers, of course, have other problems. Their operators are going to have to start making mark sense tickets, and some way must be found of processing those tickets after the operator gets her share of the job done.

For many small companies, direct distance dialing itself, can possibly be delayed for a while, and even when it is instituted, the toll center will have most of the headaches — but there are still matters of subscriber education, of error correction, and of necessary equipment additions and rearrangements that must be thought of and acted on.

"Standard Form Tickets"

THE handwriting is already on the wall — this is not something that we are going to face five years from now — many, many companies will face it during this year of 1961. And the time to really get busy with it is right now.

First of all there must be complete cooperation between you and your connecting company — be it Bell or another Independent. Each of you must know exactly what the other is going to do, and when, and how.

Next, you should have some idea of where you eventually will arrive. What follows is my own opinion, and you can take it for what it is worth, but this is where I believe we are going. Sooner or later — and it will not be too late — all toll tickets will be tickets that you can feed into a machine and have the machine process up to and including billing. Furthermore, they are going to have to be *standard form tickets* — though just how long it will take the industry to arrive at a standard ticket I don't know — even the Bell System has only recently proposed such a ticket. The automatic ticketing machines will produce a punch card ticket which is machine sortable, machine billable, etc. And the operators will produce either a mark sense ticket or something like it which can be easily converted into a ticket similar to those coming out of the automatic ticketing machines, so that both can be machine intersorted and machine billed together.

OUTLOOK FOR 1961

- **Small companies will still have the problems of adequate manpower, adequate rates, increasing labor costs, higher overall per-station investment, and increasing demand for up-graded rural service.**
- **1961 will not be "just another year." For the first time in more than three decades "we will see the widespread advent of a completely new approach to long distance service."**

The trouble is, that all of this won't happen at once, and it is the interim period that will cause the most trouble, when we will still have part hand written present day toll tickets, part mark sense operator made tickets, and part tickets produced by an automatic ticketing machine.

As excellent a process as it was, the microfilming of toll tickets is rapidly coming to an end. There will be ways by which its use can be prolonged, and if you are using it, you probably should prolong the use of it as long as you can, but there is inevitably coming the time when you will have to abandon it. Your toll bills will then be machine produced. The toll tickets — all of them eventually — will be fed into a machine which will print up your toll bill. Either you will have to own or rent this machine, or farm out your toll billing to someone who has such a machine. Hand sorting, hand posting, hand filing — all of these will go out the window.

All companies will have these ticket problems, regardless of who handles your toll business, or how. Companies that do a part, or all, of their own toll operating (partial or full toll centers) will have other problems,

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"Training" — The Big Job In '61

A GUIDE TO TRAINING SESSIONS

• **During 1961 all industry members will be required to increase their willingness to work, and their willingness to learn new methods and new techniques. This article provides a guide to the training sessions scheduled for 1961 by telephone associations and the industry's manufacturers and suppliers. Each course is described in the article, and Exhibits One and Two provide complete "who," "what," "where," and "when" data on scheduled training sessions.**

By C. D. EHINGER*

I FEEL reasonably certain that nearly every *Telephone Engineer & Management* subscriber who reads this article has contacted, at one time or another, the books written by Horatio Alger. Some of the Alger books are rapidly becoming collectors' items and, today, our youngsters would consider them quite naive, unsophisticated, and generally "corny."

Practically everyone of the Alger books started out with the poor, bedraggled hero who came to the big city to seek his fortune in the hard, cruel world. Our hero invariably had tragedies befall him, but he always had scrupulous honesty, perseverance, and willingness to work, at any task, when all others had long ago given up. The prevailing theme of all the Horatio Alger books was that such qualities would always win in the end. Some of the titles were indicative of this thought. I can vaguely remember "Sink or Swim," "Do or Die," and others in a similar vein.

Halfway through the book, our hero was always the victim of some plot or misfortune, and through no fault of his own, was faced with a prison term, loss of life, loss of his job, or some other varied type of mayhem. At the three-quarter mark, by dint of unswerving determination and a lot of perspiration, he usually saw a break in the dark clouds that surrounded him.

At the end of the book, he had always managed to rescue the millionaire factory owner from dire circumstances, had rescued the boss's daughter from certain destruction, or better yet, had married his employer's daughter. In any event, his sterling character always managed to overcome all obstacles.

"It Applies To 1961"

WHAT, if anything, does a dimly remembered bit of our childhood reading have to do with a forecast for 1961 for the telephone industry? As the carnival barker sometimes replies "That's a good question, boy, and I'm glad you asked me."

The traits of the mythical heroes presented by Horatio Alger have long been associated with the telephone industry. Whether or not we recognize it, our industry has always been noted for its strict honesty in dealings with its customers, employes, and its own member companies. Perseverance is more than evidenced by over a half-century of expansion and continual improvement of service. However, it appears to be evident that all of us will be required, during 1961, to *increase* our *willingness to work* and, more important, *our willingness* to *learn new methods* and *new techniques.*

I am not directing my attention, in these remarks, to any particular segments of any telephone company. We can usually break down a telephone company into the broad categories of commercial, accounting, traffic operating, outside plant construction and maintenance,

Mr. Ehinger is president of the Citizens Telephone Co., Decatur, Ind.

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AE gives you a choice of four models: Prepay, Local Prepay, Postpay and Semi-postpay. Replacement parts are always in stock. An anti-stuffing device prevents fraud. A slug ejector guards the 25¢-coin channel. Standard mountings fit all phone booths. And, AE paystations come in 10 beautiful colors to attract more business. Get the paystation you can be sure of! Get the paystation engineered by Automatic Electric.

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ONE NICKEL WILL NOT WORK —
USE TWO NICKELS OR ONE DIME
1. LISTEN FOR DIAL TONE
2. DEPOSIT DIME OR TWO NICKELS
3. DIAL NUMBER DESIRED
COIN RETURN
OPERATOR

AUTOMATIC ELECTRIC

Subsidiary of

GENERAL TELEPHONE & ELECTRONICS

central office installation and maintenance, and specialized equipment installation and maintenance, and we know each category is soon to see sweeping changes in its own field.

I should also mention that I am not directing my thoughts at any one size telephone company as I believe that this point of increased work output required from all of us is applicable whether we work for a very small company or one of quite large size.

The Need For "Know-How"

DURING my years as a telephone man, I have learned that about the most important ingredient in any business is that thing called "*know-how*," which can be defined as the knowledge of how a thing can be done best, coupled with the ability to so do it, or to get it done.

It was this "*know how*," as much as anything else, that made possible the miracle of production performed by American industry during the war. Raw materials and manufacturing capacity alone could not have done the job. Many countries have plenty of raw materials, natural resources and available labor — many have raw materials the United States does not possess, and from which it was shut off during the war. But they lacked the "*know how*" of American management and labor — and that is what turned the trick in the U.S.A.

There is always need for this "know how" in any industry, including the telephone industry. The older an industry becomes the more it needs this ability to know not only what to do, but also how best to do it, or get it done.

The telephone business was a great deal simpler in its earlier days than it is now. It needs more "*know how*" now than it needed then. Consider the history of the development of telephone equipment and plant. The original magneto switchboard was a fairly simple proposition, and the work of erecting poles and stringing wires on them was not complicated. Almost anybody could learn in a short time how to deal satisfactorily with plant and equipment of the early days.

But, as time went on, telephone people had to learn how to maintain and operate common battery boards, later becoming multiple boards; then, in many places, dial equipment. They had to learn how to put their wires, in cables, underground. They had to learn how to build long haul toll lines that would provide satisfac-

I: Guide To Telephone Training Schools & Meetings — (Associations)

SPONSOR	SUBJECT	DATES	LOCATION	FOR MORE INFORMATION CONTACT—
CALIFORNIA TELEPHONE ASSOC.	Central Office Practices.	Jan. 19-20	Los Gatos, Calif.	Neal C. Hasbrook, sec.-treas., California Independent Telephone Assoc., 760 Market St., Rm. 1025, San Francisco 2, Calif.
	Outside Plant Construction and Engineering.	March	Bakersfield, Calif.	(Same as above.)
	Traffic.	March	Fresno, Calif.	(Same as above.)
	Commercial.	April	San Francisco, Calif.	(Same as above.)
	Safety.	May	Fresno, Calif.	(Same as above.)
	Accounting.	December	Palo Alto, Calif.	(Same as above.)
MINNESOTA TELEPHONE ASSOC.	Dial Conversions.	Spring, Summer, Fall	To be announced.	Keith W. Vogt, sec.-treas., Minnesota Tel. Assoc., 1614 Pioneer Bldg., St. Paul 1, Minn.
	Carrier.	Spring, Summer, Fall	To be announced.	(Same as above.)
	Accounting.	Spring, Summer, Fall	To be announced.	(Same as above.)
	Splicing Aluminum Cable.	Spring, Summer, Fall	To be announced.	(Same as above.)
	Public Relations.	Spring, Summer, Fall	To be announced.	(Same as above.)
	Aspects of rates and rate cases.	Spring, Summer, Fall	To be announced.	(Same as above.)
	Commission Relations.	Spring, Summer, Fall	To be announced.	(Same as above.)
	Development of "Current value" rate base.	Spring, Summer, Fall	To be announced.	(Same as above.)
	Transmission Standards.	Spring, Summer, Fall	To be announced.	(Same as above.)
	Minimum wage, operator exemption.	Spring, Summer, Fall	To be announced.	(Same as above.)
	Directories, revenue, covers, etc.	Spring, Summer, Fall	To be announced.	(Same as above.)

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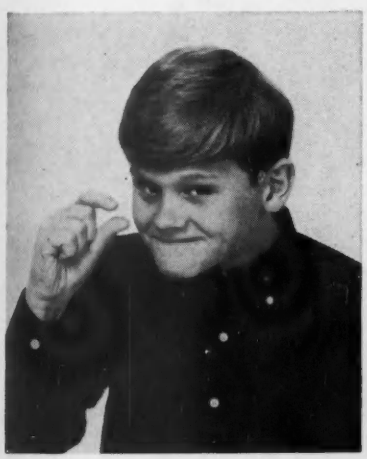
Hey, Pop!

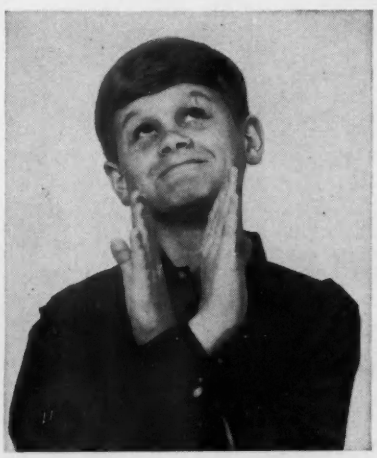
What's only this big

But stretches this far?

It takes you for miles



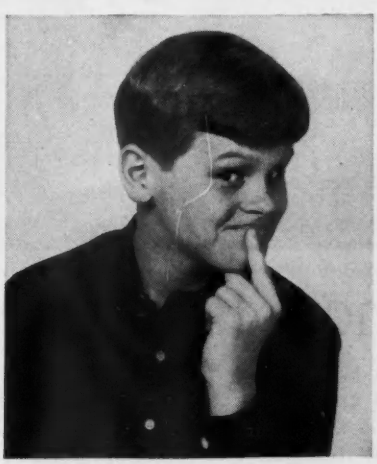
But you never move an inch.



It fixes things up for you

But hardly ever needs fixing itself.

You use it all the time



Which is why it saves you time.

Give up? Then turn the page, Pop.

It's your telephone!

Here's a novel Bell System ad designed to remind people *memorably* of the telephone's great value in everyday life. It's a public relations effort that benefits our entire industry. Look for it in these nationally read magazines: *Life,* January 9; *Look,* January 3; *The Saturday Evening Post,* January 14; *Time,* January 9; *Newsweek,* January 9; and in January issues of *Ladies' Home Journal, McCall's, Good Housekeeping, Redbook, American Home, Better Homes & Gardens, Living for Young Homemakers, Parents', Woman's Day,* and *Everywoman's Family Circle.*

BELL TELEPHONE SYSTEM

tory transmission over thousands of miles. As time went on, they had to learn how to put many of those toll lines underground. Many other instances could be cited of the increasing need for *"know how"* as the industry developed from its earlier and less complicated stages.

Now there is need throughout the industry for *even more and new kinds of "know how."* There are now being introduced into the business many new things, most of them not even thought of in the earlier days. As these and other new things come along, the industry must develop people who know how to adapt them to commercial communications — how to manufacture them, install them, maintain them, and make them serve their respective purposes in the telephone industry in the best possible way.

It is possible for these things themselves to be developed faster than *people* can be developed in the industry to deal with them. That, in fact, may be taking place right now — there seem to be too few people in

Next page, please

I: Guide To Telephone Training Schools & Meetings — (Associations)

(Concluded from page 54)

SPONSOR	SUBJECTS	DATES	LOCATION	FOR MORE INFORMATION CONTACT—
OREGON AND WASHINGTON TELEPHONE ASSOCIATIONS, AND WEST COAST TELEPHONE CO.	Basic Lineman. (Three weeks course.)	Continuously throughout year.	Everett, Wash.	Harley J. Barber, sec.-treas., Oregon Telephone Assoc., Box 331, Beaverton. Ore. or, A. J. Zimmerman, exc. vice pres., Washington Tel. Assoc., 327 Old Times Square, Seattle 1, Wash.
	Installer-Repairman, Part II. (Two weeks course.)	Continuously throughout year.	Everett, Wash.	
	Strowger Switches. (Two weeks course.)	Continuously throughout year.	Everett, Wash.	
	XY Switches. (Two weeks course.)	Continuously throughout year.	Everett, Wash.	
	Trouble Shooting and Specs. (One week course.)	Continuously throughout year.	Everett, Wash.	(Same as above.)
	Basic Electricity. (Three weeks course.)	Continuously throughout year.	Everett, Wash.	(Same as above.)
	Circuitry and Drawings. (One week course.)	Continuously throughout year.	Everett, Wash.	(Same as above.)
	Plant Forum.	Feb. 9-10	Oceanlake, Ore.	(Same as above.)
	Commercial & Acctg. Forum.	To be announced.	To be announced.	(Same as above.)
PENNSYLVANIA TELEPHONE ASSOCIATION	Executive Development Course.	September	To be announced.	A. C. Herbert Pennsylvania Tel. Assoc. Payne-Shoemaker Bldg. Harrisburg, Pa.
UNITED STATES INDEPENDENT TELEPHONE ASSN.	Engineering Conference.	To be announced.	Mich. State Univ. East Lansing, Mich.	R. J. Loveland Calif. Water & Telephone Co. 300 Montgomery Street San Francisco 4, Calif.
	Management Development Program.	To be announced.	To be announced.	R. J. Fegan Junction City Telephone Co. 126 West Sixth Street Junction City, Kansas
	Marketing and Merchandising Seminar.	To be announced.	To be announced.	Allan R. Stacey Sunland-Tujunga Tel. Co. 8000 Foothill Blvd. Sunland, Calif.
WISCONSIN TELEPHONE ASSOCIATION	Merchandising Seminar.	Feb. 28-Mar. 1	Univ. of Wis. Madison, Wis.	Ray J. Riordan Wisconsin Tel. Assoc. 119 E. Washington Madison 3, Wis.
	Carrier School.	To be announced.	To be announced.	(Same as above.)
	Fall Management Conference.	Oct. 25-26	Eau Claire, Wis.	(Same as above.)
	Management Conference.	March	Green Bay, Wis.	(Same as above.)

II.—A Guide To Telephone Training Sessions—(Suppliers)

SPONSOR	SUBJECTS	DATES	LOCATION	FOR MORE INFORMATION CONTACT—
AUTOMATIC ELECTRIC SALES CORP.	Central Office Maintenance. (Nine Weeks course — basic electricity, relays, step-by-step switches, 200 hours of bench work; special items.)	Jan. 9-Mar. 10 Mar. 13-May 12 July 17-Sept. 15 Oct. 16-Dec. 15	Northlake, Ill. Northlake, Ill. Northlake, Ill. Northlake, Ill.	Director of Sales Training Automatic Electric Sales Corp., Northlake, Ill.
	Strowger Automatic Toll Ticketing. (Four weeks course — basic theory of ticketing operation; 12 hours bench work.)	Jan. 9-Feb. 3 Sept. 18-Oct. 13	Northlake, Ill. Northlake, Ill.	(Same as above)
COLLINS RADIO CO.	Microwave & Carrier. (Communication system engineering symposium and operating exhibit.)	Jan. 23-27 Feb. 6-10 Feb. 20-24 Mar. 6-10 Mar. 20-24 Apr. 3-7 Apr. 17-21	Portland, Ore. San Francisco, Calif. Los Angeles, Calif. Albuquerque, N. M. New Orleans, La. Jacksonville, Fla. Charlotte, N. C.	Directors of Information, Collins Radio Co., Box 1891, Dallas, Texas.
COMMUNICATION EQUIPMENT & ENGINEERING CO.	Transmission Symposiums. Any individual telephone company, telephone association, or distributor of telephone supplies may arrange for a one-day Transmission Symposium with speakers and equipment provided at no cost. Discussion subjects include: Theory of loading (What is loading, when is loading needed, what to expect from loading, and cost of loading.)	Dates to be announced.	Locations to be announced	Organizations desiring to sponsor a "Transmission Symposium" should write: Ken Gillette, Communication Equipment & Engineering Co., 5646 W. Race Avenue, Chicago 44, Ill.
ITT KELLOGG	Central Office Maintenance. (Switching systems — Crossbar, relaymatic, step-by-step, toll ticketing, industrial control, special systems.)	Periodic intervals during the year.	Chicago, Ill.	Customer Training Manager, ITT Kellogg, 6650 S. Cicero Avenue Chicago, Ill.
	Customer's Training Services. (Subscriber carrier, trunk carrier, multiplex equipment for radio and cable, radio, line concentrators.)	Periodic intervals during the year.	Raleigh, N. C.	(Same as above)
LEICH SALES CORP.	CAX Terminal-Per-Line. (Five weeks course — basic electricity, telephone systems, circuit analysis, Leich equipment assembly, adjustment, and inspection.)	Jan. 10-Feb. 17 Mar. 28-May 5 Aug. 15-Sept. 22 Oct. 31-Dec. 8	Genoa, Ill.	H. O. Whiteley, Leich Electric Co., Genoa, Ill.
	40 A PABX and Terminal-Per-Station CAX. (Two weeks each course — analysis of circuits and operation of units for each type.)	Feb. 20-Mar. 3 Mar. 13- Mar. 24 June 12-June 23 July 24-Oct. 6 Oct. 16- Oct. 17	Genoa, Ill.	(Same as above)
LENKURT ELECTRIC CO.	45-Class Equipment Test & Maintenance.	1-9-61 1-16-61	San Carlos, Calif.	F. C. Hill, Lenkurt Electric Co., San Carlos, Calif.
	74A Equipment Test & Maintenance.	1-23-61	San Carlos, Calif.	(Same as above.)
	45BX Equipment Test & Maintenance.	2-6-61	San Carlos, Calif.	(Same as above.)
	74A Equipment Test & Maintenance.	2-13-61	San Carlos, Calif.	(Same as above.)
	45-Class Equipment Test & Maintenance.	2-27-61 3-6-61	San Carlos, Calif.	(Same as above.)

Continued on page 60

NORTHEASTERN TELEPHONE CORPORATION ups toll revenues by more direct routing with Collins microwave . . .

Collins system allows this Kentucky company to expand toll service. The system, expandable to 240 channels, now provides 18 toll channels between the company's toll center at London, Kentucky, and its satellite exchanges at Mt. Vernon, Brodhead and Livingston, and six channels on to Science Hill, Kentucky. By relying entirely on its own facilities, Northeastern has gained a substantial increase in operational reliability. For information on a microwave-carrier system tailored to your individual requirements, contact Collins Radio Company, Texas Sales Division, 1930 Hi-Line Dr., Dallas 7, Texas.

COLLINS MICROWAVE AND CARRIER

COLLINS

COLLINS RADIO COMPANY • DALLAS, TEXAS • CEDAR RAPIDS, IOWA • BURBANK, CALIFORNIA

II: Guide To Telephone Training Sessions — (Suppliers)

(Concluded from page 58)

SPONSOR	SUBJECTS	DATES	LOCATION	FOR MORE INFORMATION CONTACT—
LENKURT ELECTRIC CO.	74A Equipment Test & Maintenance	3-13-61	San Carlos, Calif.	F. C. Hill, Lenkurt Electric Co., San Carlos, Calif.
	45BX Equipment Test & Maintenance.	4-10-61	San Carlos, Calif.	(Same as above.)
	74A Equipment Test & Maintenance.	4-17-61	San Carlos, Calif.	(Same as above.)
	45-Class Equipment Test & Maintenance.	5-1-61 5-8-61	San Carlos, Calif.	(Same as above.)
	74A Equipment Test & Maintenance.	5-15-61	San Carlos, Calif.	(Same as above.)
	81A Equipment Test & Maintenance.	5-22-61	San Carlos, Calif.	(Same as above.)
	45-Class Equipment Test & Maintenance.	6-5-61 6-12-61	San Carlos, Calif.	(Same as above.)
	74A Equipment Test & Maintenance.	6-19-61	San Carlos, Calif.	(Same as above.)
	81A Equipment Test & Maintenance.	6-26-61	San Carlos, Calif.	(Same as above.)
NORTH ELECTRIC CO.	NX-Z Modular Crossbar. (6 weeks course — Medium and small exchanges, theory, maintenance, operation.)	Feb. 27-Apr. 7 Sept. 11-Oct. 20	Galion, Ohio	Director of Training, North Electric Co., Galion, Ohio
	Premium Toll Ticketing. (6 weeks course — theory of operation, maintenance.)	Apr. 10-May 19 Oct. 9-Nov. 17	Galion, Ohio	(Same as above.)
	NX-1 Modular Crossbar. (8 weeks course — medium and larger exchanges, theory, maintenance, operation.)	May 1-June 23	Galion, Ohio	(Same as above.)
STROMBERG-CARLSON CO.	XY Dial Systems. (6 weeks course — Standard tickets used in XY dial systems, office practices, maintenance, and adjustment, testing apparatus.)	Jan. 4-Feb. 14* Mar. 1-Apr. 11* Apr. 26-June 6* June 21-Aug. 1 Sept. 6-Oct. 17 Nov. 8-Dec. 19 *Sessions already filled.	Rochester, N. Y.	(Commercial) T. C. Thompson, Gen. Mgr., Commercial Sales, Stromberg-Carlson, Rochester 3, N. Y.
	XY-Toll Ticketing Systems. (8 weeks course — covers LID, MID, and LID-MID. Circuits, recorders, readout equipment ticketing, maintenance, and operating. May include electronic switching, carrier-microwave, key systems, etc.)	Apr. 15-May 30 Oct. 3-Nov. 21	Rochester, N. Y.	(Armed Services) Henry C. Sheve, Mgr. Military Marketing, Stromberg-Carlson, Rochester 3, N. Y.
	Special Advanced Communications School.	Jan. 4-Feb. 14	Sheppard Air Force Bases, Sheppard, Texas	(Same as above.)
UNITED STATES INSTRUMENT CORP.	Motorswitch Central Office. (2 weeks course — Theory maintenance and operation.)	Fall of '61	Charlottesville, Va.	Sales Dept., United States Instrument Corp., Box 1288, Charlottesville, Va.
	Type-30 PBX. (2 weeks course — theory, maintenance and theory.)	Fall of '61	Charlottesville, Va.	(Same as above.)
	Type 40 PBX. (2 weeks course — theory, maintenance and operation.)	Fall of '61	Charlottesville, Va.	(Same as above.)

the industry now who are expert in the use of new things available to the industry now.

The existing rapid development of new things available for the telephone industry means that there must also be developed for or brought into the industry people with the "*know how*" to deal with all these new things.

New methods, new concepts, and new operations are appearing almost daily. I will not attempt to enumerate all of them as any person who reads *Telephone Engineer and Management* regularly is fairly well versed as to what most of these new procedures are.

"How Do We Fit?"

HOW do you and I, as members of this industry, fit into this new concept and this new picture? I think it is apparent to all of us that the answer *must* be in more specialized training for *each one* of us. Accordingly, my forecast for 1961 is that we will see nearly every telephone company place an emphasis on specialized training of employes.

Where do we find all this special training? How do we go about obtaining it? Who are the individuals who will receive it? What will be the training? Fortunately, our manufacturers, the USITA, and our state associations have also recognized the fact that we must rapidly embark on a continuing program of specialized training for various segments of our industry.

In the more technical aspects, practically every manu-

A Directory for

The Eastern Indiana Telephone Company

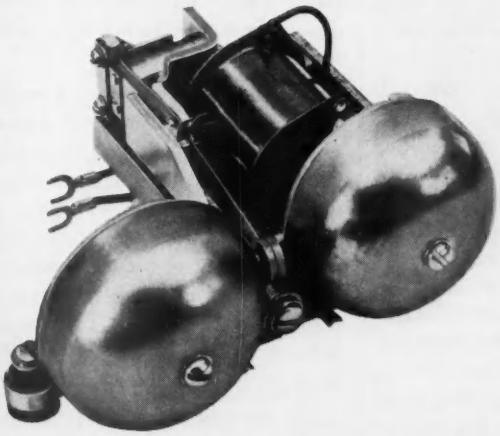
Printed by

R. R. Donnelley & Sons Company

350 East Twenty-second Street, Chicago 16

USI Straight Line RINGERS

***USI Know-How "Rings the Bell" Again!**



Versatility: The USI Straight Line Ringer is designed to fit any telephone which uses a WEC4A Ringer. All basic parts are interchangeable with the famous USI Multi-Frequency Ringer.

Sensitivity: High impedance with corresponding low power requirements means a reduction of interference in adjacent circuits and low attenuation in the talking circuit. USI Ringers are the industry's basis for comparison.

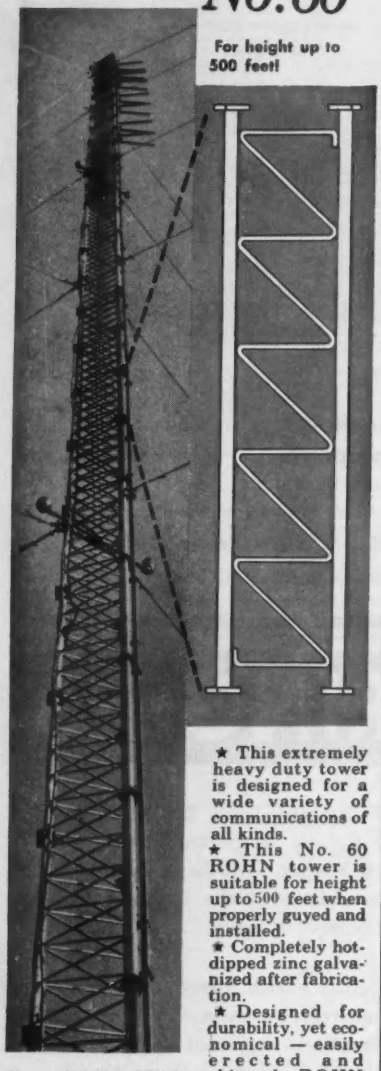
Economy: Durability of parts, complete customer satisfaction and lack of service calls mean the highest investment return for you. Why not do as countless companies have done? Specify USI ! !

* RECOGNIZED EXCELLENCE IN RINGERS

UNITED STATES INSTRUMENT CORP.

CHARLOTTESVILLE, VIRGINIA

ROHN COMMUNICATION TOWER *No. 60*



For height up to 500 feet!

★ This extremely heavy duty tower is designed for a wide variety of communications of all kinds.
★ This No. 60 ROHN tower is suitable for height up to 500 feet when properly guyed and installed.
★ Completely hot-dipped zinc galvanized after fabrication.
★ Designed for durability, yet economical — easily erected and shipped. ROHN towers have excellent workmanship, construction and design. Each section is 10 feet in length.

Shown above is a ROHN No. 60G tower used for FM broadcasting, installed to a height of 300 feet.

FREE

Details and complete engineering specifications gladly sent on request. Also ROHN representatives are coast-to-coast to assist you.

Write-Phone-Wire Today!

ROHN *Manufacturing Co.*
Box 2000,
Peoria, Illinois
Phone 637-8416

"Pioneer Manufacturers of Towers of All Kinds"

facturer of major telephone equipment now offers courses in specialized phases of the items which they manufacture and distribute. Training courses in the theory and maintenance of central office switch gear, carrier, radio, repeaters, PBX's, cable plant, transmission engineering, and others are available.

The USITA sponsors seminars aimed primarily at engineer, and management personnel, and will soon sponsor a somewhat similar session aimed mainly at the marketing phases of the telephone business. Many of the state associations have training programs which cover a variety of fields and vary widely as to scope and duration.

Training Sessions offered By Telephone Associations

AT this date many of the nation's telephone associations have not completed their plans for training sessions to be held during 1961. However, a survey conducted by *Telephone Engineer & Management's Research Department*, indicates that the majority of the associations will sponsor training sessions for management, supervisory, and technical personnel during '61. To familiarize industry members with the sessions thus far planned for '61, we are listing the information given our Research Department by the various associations:

California Independent Telephone Association: — The Association's Training Program Committee has scheduled training sessions (*See Exhibit One*) on the following subjects at the locations and on the dates indicated: *Central Office Practices* — Western California Telephone Co., Los Gatos, Calif., January 19-20, 1961; *Outside Plant Construction and Engineering* — Bakersfield, Calif., March 1961; *Traffic* — Fresno, Calif., March, 1961; *Commercial* — San Francisco, Calif., April, 1961; and *Safety* — Fresno, Calif., May, 1961.

The specific dates, and the hotel or company at which the last four training sessions will be held have not yet been determined.

Any officer or employe of any member company is eligible to attend the training sessions. The only costs involved to participants are transportation, hotel room and meals.

The Association's training sessions are generally conducted by a panel, each member of which will speak on a specific subject associated with the general classifications set forth above. After each panel member has made his presentation, the subject is then discussed by those attending the session.

The training sessions are not designed to train new employes in a specific job, but are for the purpose of acquainting employes with new methods and improving current practices. Complete information may be obtained from Neal C. Hasbrook, secretary, California Independent Telephone Association, 760 Market St., San Francisco 2, Calif.

The Illinois Telephone Association: — During 1961 the Illinois Association will have several meetings that will be training sessions for operating people. However, meeting dates and locations have not been established.

According to Executive Secretary, John F. Tharp, the Illinois Association has the state divided into four districts. The usual procedure is to have approximately three meetings of all telephone people in each of the four districts each year. All meetings are basically training sessions, involving problems relating to traffic, plant, commercial and etc.

Kansas Telephone Association: — During 1961 the Kansas association will sponsor its regular Fall District Meetings, and possibly a series of Spring meetings touching on subjects designed to improve Independent telephone company management, operations, and relationships with the public served. The specific subjects to be discussed at the 1961 meetings have not been determined.

The recently concluded 1960 meetings presented a complete plan for the establishment of a public relations program for Independent companies. It is likely that the 1961 meetings will be directed more to the technical side of the business. One of the subjects mentioned for possible inclusion

is installation and maintenance of carrier equipment.

All members of the Kansas association are eligible to attend the meetings sponsored by the association. The meetings are usually arranged with geographic considerations in mind to permit attendance by the broadest possible segment of the membership. There is usually no cost to the participants aside from the cost of meals while in attendance and transportation expense.

Complete information on any session to be sponsored by the association in 1961 can be obtained from the association office as soon as the meetings are scheduled and the subjects to be treated are selected.

Minnesota Telephone Association, Inc.: — During 1961 the Minnesota association plans several training meetings (*See Exhibit One*) for telephone people of Minnesota. The subjects to be covered are: (a) Steps to take to convert to dial; (b) carrier equipment, application and use; (c) accounting, Uniform System of Accounts prescribed by the commission; (d) splicing aluminum cable; (e) public relations; (f) satisfactory rates and rate of return; all aspects of the rate case; (g) commission relations; (h) how to develop a "current value" rate base; (i) transmission standards; (j) minimum wage, 750-station operator exemption; and (k) directories, revenue, covers etc.

The classes will be held spring, summer and early fall. Exact locations have not been established.

According to Keith Vogt, executive secretary, everyone is eligible to attend — all telephone people, all suppliers too, and there is no cost to participants. Complete information may be obtained from Keith W. Vogt, secretary-treasurer, Minnesota Telephone Association, Inc., 1614 Pioneer Bldg., St. Paul 1, Minn.

North Carolina Independent Telephone Association, Inc.: — For the past three years the North Carolina Association has sponsored a Spring Conference for all members of the association. The subjects covered included commercial, plant, traffic and accounting. The 1960 conference was held at the Sedgefield Inn

NEW! LOW COST, RELIABLE, PRECISION, TRANSISTORIZED TRANSMISSION • TEST EQUIPMENT from NORTHEAST ELECTRONICS CORPORATION

MODEL TTS 11 LEVEL MEASURING SET
- Measuring Range: +8 dbm to −30 dbm
- Input Impedance: 600 or 900 ohms
- Balanced transformer and step attenuator
- Switchable hold coil
- Terminals for TEL set
- Size: 7" l x 5" w x 5" h

Price $140.00

MODEL TTS 14 LEVEL METER
- A small, rugged, single range level meter
- Measuring Range: 0 to −20 dbm
- Wide frequency response: 100 cps to 600 KC
- Terminals for TEL set
- Hold provisions
- Size: 5¼" l x 3½" w x 2⅝" h

Price $72.00

MODEL TTS 15 TRANSMISSION TEST SET
- A compact set for measuring levels from +8 dbm to −30 dbm and to supply a 0 dbm signal at six frequencies.
- Input and Output Impedances: 600 and 900 ohms
- Simultaneous Send and Receive
- Switchable hold coil
- Terminals for TEL set
- Size: 7" l x 5" w x 6¼" h

Price $235.00

The above are additions to a wide line of telephone test equipment including the well known high precision, transistorized Model TTS 4A Transmission Test Set and Model TTS 9S Frequency Cycling Reference Generator, and many others. Write for complete catalogue.

An Extensive Line of Telephone Test Equipment available from —

NEC NORTHEAST ELECTRONICS CORPORATION
AIRPORT ROAD • CONCORD, NEW HAMPSHIRE

near Greensboro. At this writing the association's 1961 plans are incomplete. However, if the 1961 conference is held, all employes of the various member companies will be invited to attend and participate in the discussion. The entire cost is paid by the association. Information concerning plans for the 1961 training session may be obtained from Royster M. Tucker, president.

Ohio Independent Telephone Association: — The Ohio Association will conduct six district public relations meetings in the autumn, the dates and locations of which have not been set for 1961. Supplementing these meetings, the association has technical committees devoted to plant, traffic, accounting, commercial-public relations, transmission betterment, and small company problems. These committees, consisting of operational personnel of the Ohio Independent telephone industry, meet quarterly, or on call to resolve technical and operational problems.

Oregon Independent Telephone Association: — According to Secretary Harley J. Barker the West Coast Telephone Co., is conducting a continuous plant training program at Everett, Washington in most all phases of plant work (*See Exhibit One*). These classes are available to any Independent telephone company employe in the states of Oregon and Washington, and the cost depends on the number of people attending the class. The actual cost of conducting each class is prorated among those attending and varies from $30. to $90. per pupil for a two weeks class. (For complete description of the program see comments under Washington Independent Telephone Asociation.)

In addition to the above classes, the Oregon Association conducts a two or three-day Plant Forum, and a two or three-day Commercial and Accounting Forum each year. These forums consist of lectures, demonstrations and exhibits of the latest methods and equipment, as well as subjects which have been suggested by a poll of the membership.

The programs are conducted through the cooperation of competent people in the Independent telephone industry, as well as those of the Bell System and the manufacturers and suppliers.

The 1961 Plant Forum will be held on February 9 and 10. The exact location and program have not been definitely decided, but it will be held at the King Surf at Depoe Bay, or at the nearby beach resort of Oceanlake on the Oregon coast. The program will emphasize new phases of cable construction, maintenance, and transmission testing. The chairman of the Plant Forum Committee is Lowell Brown, Jr., Valley Telephone Co., Silverton, Oregon.

The Commercial and Accounting Forum will be held later in the year under the direction of Chairman, Don Gibbs, Redwoods Tel. Co., Cave Junction, Oregon. Details of this forum have not been decided at this time.

Pennsylvania Independent Telephone Association: — Executive Vice President A. C. Herbert reports that the Pennsylvania association expects to repeat the Executive Development Course which it held in September, 1960 at Pennslyvania State University. "We will probably have this course again next September," Herbert stated, "but the exact dates and location are not definite. The cost was $115. tuition, and $65. for room and board. It is a five-day course."

The association is considering a two-day course restricted to managers only, but have not worked out details. Complete information may be obtained from A. C. Herbert, executive vice president, Pennsylvania Independent Telephone Association, Payne-Shoemaker Bldg., Harrisburg, Pa.

Virginia Independent Telephone Association: — At present the association does not have any schools scheduled for 1961. However, the organization normally holds several conferences each summer at Charlottesville, Va., for the purpose of discussing new telephone features, as well as new slants on old problems. These meetings usually consist of one each for the Plant, Accounting, Traffic and Commercial personnel.

Information on the 1961 conferences may be obtained from C. P. Lamm, secretary-treasurer, Virginia Independent Telephone Association, Charlottesville, Va.

Washington Independent Telephone Association: — The Washington Independent Telephone Association, through the West Coast Telephone Co., Everett, Wash., has, for the past two years, offered to all interested Independent telephone company personnel in the Western states, the following technical courses of study:

(1) *Basic Lineman*: — Beginners in pole climbing; setting poles; attachment of hardware, brackets and crossarms; drop and block wire attachments, including various building materials; line specifications; and safety practices. This course requires 120 hours over a three-week period.

(2) *Installer-Repairman*: Part II, includes station and extension installation; instrument and facilities trouble shooting; central office duties of installer-repairmen; plant records; service orders; time reports; drop and block wire and protection; plant specifications; and safety practices. This course requires 80 hours over a two-week period.

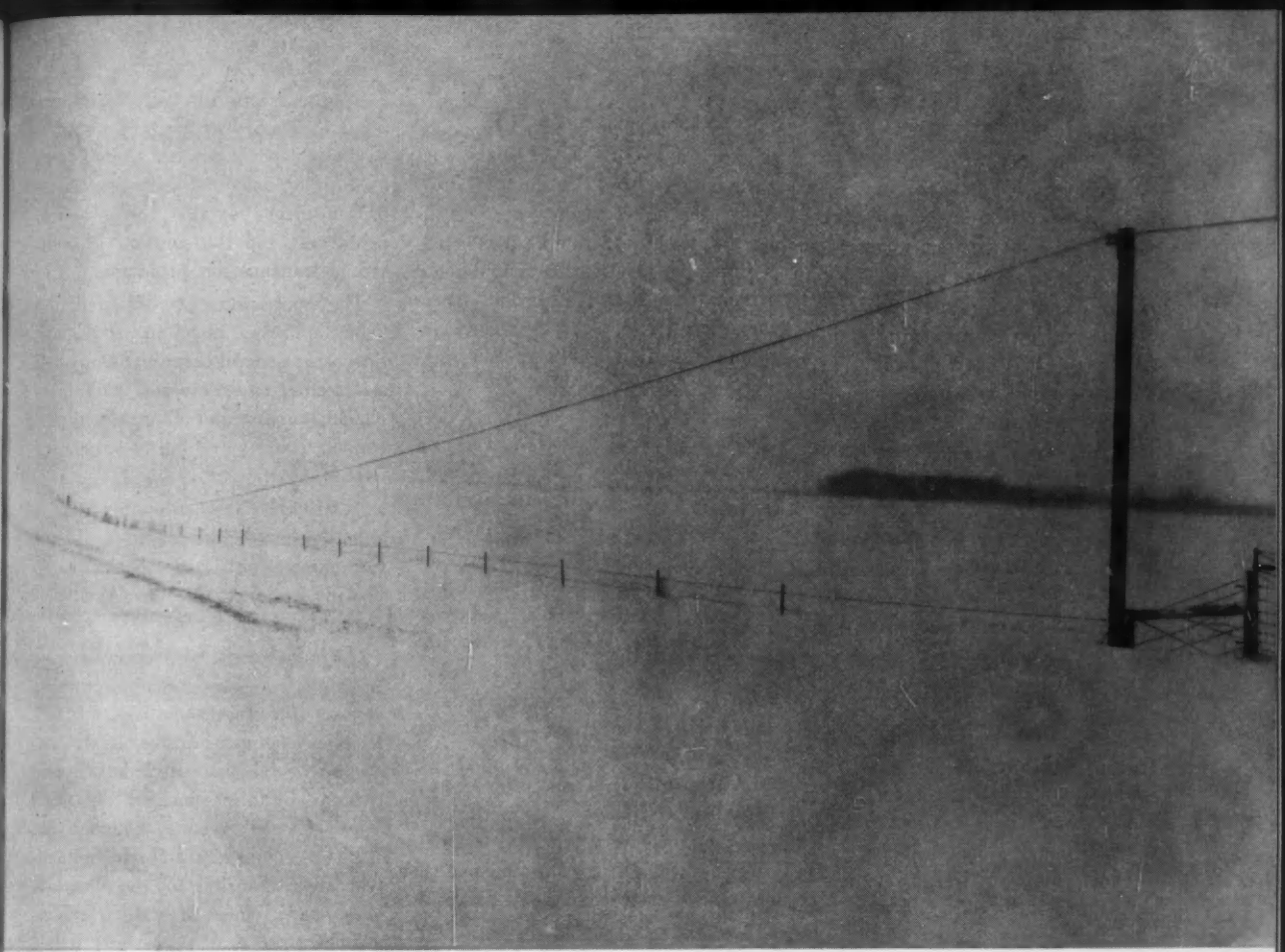
(3) *Installer-Repairman*: Part III, includes maintenance of PBX installations, PABX installations; installation and maintenance of key systems, coin collectors, subscriber carriers; testing and clearing toll troubles. This course requires 80 hours over a two-week period.

(4) *Strowger Switches*: Includes maintenance and adjustments of central office switches. This course requires 80 hours over a two-week period.

(5) *X-Y Switch Maintenance and Adjustment*: This course requires 80 hours in a two-week period.

(6) *Trouble Shooting and Specifications*: Short-cuts in trouble shooting for outside plant and central office. This course requires 40 hours in one week.

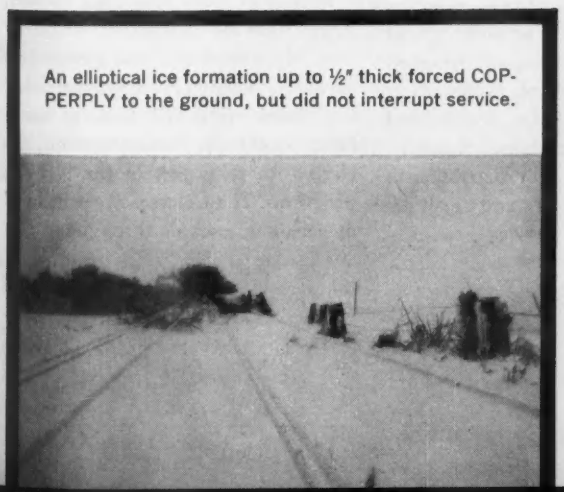
(7) *Basic Electricity*: Essentials of basic electricity in telephone circuits and central offices; load requirements and protective devices. This course re-



"The lines are down... but I hear you perfectly"

These words came from a Tyler, Minnesota farm wife during a severe ice storm last winter. She could see that the lines were down. But there was no interruption in service.

Throughout the entire countryside around Tyler, the Tyler Telephone Company had installed .080-25 COPPERPLY conductor wire in new long-span lengths (up to 1900 feet between poles) to test a completely new concept in aerial insulated wire plant. By stringing insulated COPPERPLY over such long spans, it is possible for the wire to rest on the ground, when loaded with ice, before it reaches 55% of ultimate strength. When the ice load melts, COPPERPLY returns to the normal unloaded height above the ground.



An elliptical ice formation up to ½" thick forced COPPERPLY to the ground, but did not interrupt service.

At Tyler, National-Standard COPPERPLY remained under three feet of snow in some places for as long as three months, with no interruption in line service. In addition, long-span systems cut installation costs, eliminated the problem of mid-span hits, reduced tree trimming and maintenance costs. For information on the complete line of COPPERPLY conductors, write National-Standard Company, Niles, Michigan. C-61-2

NATIONAL-STANDARD COMPANY
Niles, Michigan

quires 120 hours over a three-week period.

(8) *Circuitry and Drawings*: Reading elementary and advanced drawings and specifications. This course requires 40 hours in one week.

In addition to the above, special schools are held for such subjects as micro-wave and radio transmission, PBX and PABX equipment, and crossbar switching equipment. The regular staff of West Coast Telephone Co., is generally supplemented by manufacturers' representatives for these special courses.

The program has been well received throughout the West Coast, and L. Gray Beck, vice president and general manager, West Coast Telephone Co., is to be congratulated upon his foresight and cooperation with the association in making this needed technical training available at the Training Center, West Coast Telephone Co., 2202 Hewitt Ave., Everett, Wash., Lyle Cagley is director of division which is under the supervision of Chief Engineer, Dan Tompers.

Complete information may be obtained from A. J. Zimmerman, executive vice president, Washington Independent Telephone Association, 327 Old Times Square, Seattle 1, Washington.

Wisconsin State Telephone Association: — The Wisconsin association will sponsor a Merchandising Seminar in cooperation with the University of Wisconsin Management Institute at the University on February 28 and March 1. The seminar will be limited to an attendance of 25 and the fee runs about $115., including materials, meals and lodging. It will be the third scheduled by the association. Anyone connected with the telephone industry is eligible to attend. Registration is on a first come, first-served basis.

Considerable time and effort has been put into preparation of a Carrier School, but the association is not ready to announce dates or agenda.

On October 25 and 26 the association will conduct its annual Fall Management Conference in Eau Claire at the Hotel Eau Claire. This function covers a multitude of problems interesting to smaller companies. There is no fee and attendance is not limited.

A one day management conference is tentatively slated for Green Bay in March but no agenda has been set up nor has a definite date been selected.

Complete information may be obtained from Ray J. Riordan, secretary-treasurer, Wisconsin State Telephone Association, 119 E. Washington Ave., Madison 3, Wis.

Training Sessions Offered By Manufacturers & Suppliers

MANUFACTURERS and suppliers serving the telephone industry have indicated that the emphasis on training will be greater than it was in 1960. The plans of several companies are incomplete. However, the following companies have supplied us with the details that were available late in December (*See Exhibit Two for summary*): —

Automatic Electric Sales Corp., Northlake, Ill.: — Automatic Electric conducts two types of classes: (1) Central Office Maintenance (a nine-week class); and (2) Strowger Automatic Toll Ticketing (a four-week class.) (See *Table Two.*)

The training classes are held at Automatic Electric's Northlake, Ill., plant. The only entrance requirement is a basic knowledge of electricity and magnetism — plus some practical experience with either manual or automatic telephone equipment. Tuition is free for all classes. Complete information can be obtained by writing to the Director of Sales Training, Automatic Electric Sales Corporation, Northlake, Illinois.

Communication Equipment & Engineering Co., Chicago, Ill.: — During 1961, CEECO's industry training program will be built around a series of "Transmission Symposiums." Ken Gillette, of Communication Equip. & Engrg. Co., reports that any individual telephone company, telephone association, or distributor of telephone equipment and supplies may arrange for a one-day Transmission Symposium to be held on his premises, with speakers and equipment provided at no cost to the organization sponsoring the session (*See Exhibit Two.*)

Gillette states discussion subjects include: Theory of loading (what it is, when needed, what to expect from loading, cost of loading); upgrading of subscriber service; hypothetical problems; and the solution of individual transmission problems.

The symposiums are designed for: cable splicers; installers; construction men; general plant managers and staff; chief engineers and staff; purchasing agents; and management personnel.

Organizations desiring to sponsor a CEECO "Transmission Symposium," should write: Ken Gillette, Communication Equipment & Engineering Co., 5646 W. Race Ave., Chicago 44, Ill.

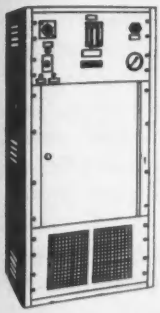
ITT Kellogg, Chicago, Ill.: — A variety of communication training courses for representatives of ITT Kellogg customers are regularly conducted at the company's office and factory building located at 6650 South Cicero Avenue, Chicago 38, Ill. These courses are for technicians who are responsible for the operation and maintenance of dial telephone switching systems (Crossbar, Relaymatic (all relay), and Step-by-Step); toll ticketing industrial control, and special systems.

In addition, customers' training services are furnished by the Telephone and Transmission Department at its facility located at 2912 Wake Forest Road, Raleigh, N. C. These courses cover such typical systems as: Rural subscriber carrier, trunk circuit carrier, carrier multiplex equipment for both radio and cable applications, microwave (PTM) radio, and line concentrators.

Personnel from telephone utilities, REA financed telephone organizations, the armed services, government agencies, industrial firms, and other companies using ITT Kellogg manufactured communication systems, are eligible to take part in the training programs. These classes are scheduled at periodic intervals throughout each year (*See Exhibit Two.*) Specific dates and outlines of individual courses are available upon request.

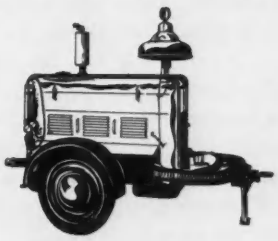
All inquiries concerning ITT Kellogg communication training courses

Pioneers in CONTINUOUS FEED PRESSURE SYSTEMS & MAINTENANCE EQUIPMENT



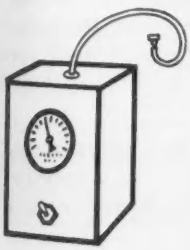
AIR COMPRESSOR DEHYDRATORS

Dehydrators in all sizes and capacities — economical — dependable — low operating cost. Write for additional information.



MOBILE POWER UNITS

Portable generator, and desiccant dryer used for underground cable splicing and similar work — can be set up and operated by one man.

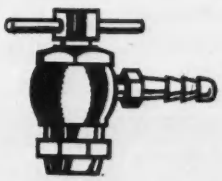


CABLE ALARM

PART NO. 8279

Bulletin: 8279-1-61

Used when installing plowed in cable under pressure when cable sheath is damaged in process of plowing in, the alarm will sound indicating damage of sheath and location can be marked and damages repaired.



PRESSURE TESTING CHUCK

PART NO. 8272

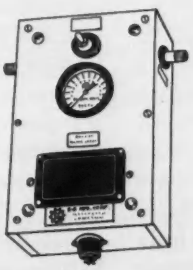
Bulletin: 8272-1-61

A new design pressure testing chuck with swivel nut to screw on pressure testing valve and 3/16" hose connector. This pressure testing chuck is guaranteed leakproof.

CABLE PRESSURIZATION COMPUTER

PART NO. 8266 • Bulletin 8266-1-61

This computer is an instrument for quickly and easily performing the mathematical computations required for cable pressure analysis procedures which are based on the computation of flow and pressure drop. It is supplied in its own plastic case.



DUAL PRESSURE KIT

PART NO. 8250

Bulletin: 8250-1-61

Used for providing lower pressure air to cable network where needed, this kit is provided with a Hi-Lo Contactor and Alarm Outlet for tying into the alarm circuit. It is supplied in a steel box approximately 3"x7"x11" and can be wall or bracket mounted.

S&G MFG. CORP.

EXTRA!
Don't miss our 1961 Ads on NEW EQUIPMENT

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S & G EQUIPMENT MEANS QUALITY, ECONOMY AND DEPENDABILITY

should be directed to the nearest regional office or to the Customer Training Manager, ITT Kellogg, 6650 South Cicero Ave., Chicago 38, Ill.

Leich Sales Corp., Chicago, Ill.: — Technical training classes scheduled by Leich Sales Corp. for 1961 will cover CAX Terminal-Per-Line, CAX Terminal-Per-Station, and 40A PABX Switchboards. (See *Exhibit Two.*)

The CAX-Terminal-Per-Line training class is divided into two sections: (1) General Fundamentals, and (2) Leich Circuits and equipment. The 40A PABX and CAX-TPS training is confined to analysis of the circuits and operation of the units.

All training sessions are scheduled to be held in the classroom at the Leich Electric Co., office building, Genoa, Ill. Employes of companies responsible for the operation and maintenance of Leich Switchboards are welcome to attend. There is no charge for the training given by Leich. The only cost is that incurred in travel to and from Genoa and living cost while attending school.

Detailed particulars may be obtained by writing directly to H. O. Whiteley, Leich Electric Co., Genoa, Ill., or calling him personally.

Lenkurt Electric Co., San Carlos, Calif.: — Lenkurt Electric Co., has been conducting a series of regularly scheduled schools for many years. In addition to regularly scheduled schools, the company frequently holds other special courses at its factory, or on customer premises by special arrangements.

The Lenkurt courses listed in *Exhibit Two* are scheduled for the first six months of 1961. The 45-Class course covers all of Lenkurt's 45-Class carrier systems. The other courses listed cover the specific systems referred to. Each of the courses are intended for the training of maintenance supervisors or maintenance training supervisors. Maintenance personnel other than supervisors are also accepted.

Because of the use of actual equipment in making tests and maintenance procedure exercises, the classes are limited in attendance. There is no cost to anyone attending as far as the conduct of the training course itself is concerned. The students are expected to pay their own transportation to San Carlos, Calif., as well as their own room and board. All of the regular courses are conducted at Lenkurt's factory in San Carlos, a suburb South of San Francisco. Additional information may be obtained by contacting F. C. Hill, Lenkurt Electric Co., San Carlos, Calif.

North Electric Co., Galion, Ohio: — The 1961 training schedule of the North Electric Co., features three main subjects: (1) NX-2 Modular Crossbar for medium and small exchanges; (2) Premium Toll Ticketing; and (3) NX-1 for medium and large exchanges. (See *Exhibit Two.*)

All sessions will be held at the North Electric Training Center, Galion, Ohio. Any telephone company employe, who in the opinion of the telephone company and North's director of training, has sufficient background to benefit from the training is eligible to attend. There are no tuition or charges for text or material. Living expenses of the participant are the responsibility of the participant or his company.

Complete information on the training session may be obtained from Director of Training, North Electric Co., Galion, Ohio.

Stromberg-Carlson, Rochester, N. Y.: — Training opportunities offered by Stromberg-Carlson include two main courses (*See Exhibit Two*):

(1) *XY Dial Systems*: — All standard circuits used in XY Dial systems, with individual opportunity for conferences on special circuits used in customer's own installation; office practices; apparatus maintenance and adjustments; and testing equipment used in maintenance procedures.

(2) *XY Toll Ticketing Systems*: — Course covers three types of systems: LID (automatic identification), MID (manual identification) and combination LID-MID; standard circuits; tape recorders and readout equipment; ticket producing equipment; testing apparatus and maintenance procedures; office practice; wherever practicable, the course is individualized to the type of equipment in service at the customers installation.

Other subjects pending at this date may include electronic switching, carrier/microwave, key systems, etc.

For enrollment in the XY Dial School, a working knowledge of basic electricity and high school algebra is desirable. For enrollment in the Toll Ticketing School, applicants should have an XY Dial School diploma or equivalent experience. Telephone managers should make contact through their own Stromberg-Carlson Branch. Normal waiting period is six months.

There is no charge for instruction, books or materials. Only expense to students is travel, lodging and food. Rooms will be found for single men at very nominal rates.

United States Instrument Corp., Charlottesville, Va.: — During the fall months of 1961 United States Instrument Corp. will conduct three training schools (See *Exhibit Two.*) Subjects will include: (1) Motorswitch Central offices; (2) the Type 30 PBX; and (3) the Type 40 PBX.

Any customer or prospective customer, who owns or may own the systems is eligible to attend the training sessions. There is no tuition expense; company must furnish room and board for representatives.

Complete information may be obtained from Sales Department, United States Instrument Corp., P. O. Box 1288, Charlottesville, Va.

"How Do We Do It?"

ANY manager of a telephone company today not only faces the who, what, where problems concerning additional technical training and courses for his employes, but is probably most concerned with the "how" of the problem.

The telephone manager must decide whether the company should pay all transportation costs to the point of training, the food and lodging of the employe while receiving the training, and whether the employe should receive full compensation or partial compensation while he is being trained.

There have been some cases where the company spent considerable sums of money in furthering special training for an employe only to have the employe almost immediately leave for some greener pastures. Such results are obviously not conducive to greater training efforts on the parts of the companies involved.

There seems to be no set pattern for the "how" arrangements followed by many telephone companies. It appears that each case must be individually decided and tailored to meet the local situation. Obviously, as an individual employe receives more and more specialized training, an entirely different situation exists than in the case of the employe who presents himself to a company already trained through his own investment in time and money.

Regardless of the problems which are presented, the "who," "what," "where," "when," and "how" questions of specialized training will always be with us and we will solve them in our own individual way and to a larger degree than ever before.

"The hole is already there . . . All you have to do is take the dirt out of it!"

Shown in *Exhibits One* and *Two* are summaries of the various training courses, symposiums, and meetings scheduled for 1961. *Telephone Engineer and Management* has attempted to secure listings from all of the various manufacturers, the USITA, state associations, etc. and compile them into this list for the benefit of the readers of this trade journal. It is quite possible that many other courses are offered and not listed here. As a service to the industry, *Telephone Engineer and Management* requests all organizations planning such courses in the future to notify the magazine so that suitable publicity and information can be disseminated to the industry.

"Take a Tip From Horatio."

IT WOULD appear that it behooves all of us to make every effort to keep abreast of the rapid developments which so vitally affect us. The only available method is to take advantage of the specialized training offered during 1961. Perhaps all of us can take a leaf from one of Horatio Alger's simple books and say to ourselves that, during 1961, it is "Specialized Training — Do or Die." — *C. D. Ehinger.*

Any comments, criticisms, or suggestions for future articles? Address all correspondence to "Sub-Harmonics and Overtones," — Telephone Engineer & Management, 7720 Sheridan Road, Chicago 26, Ill.

Call for ALTEC'S LINE of proven telephone equipment

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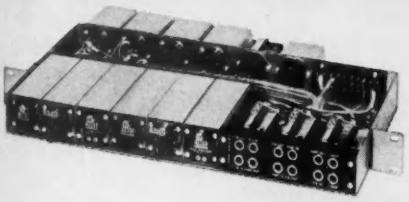
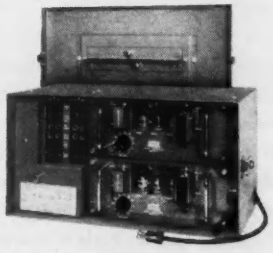
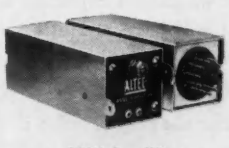


7300 Telephone Repeater Term Unit, fully complemented

Transistorized Repeater-Amplifier Terminating Equipment



S-17 Amplifier System



455A Amplifier

CHECK YOUR NEEDS FROM THIS LIST

- 453A transistor type repeater amplifier for use on 24-26 volts.
- 455A transistor type repeater amplifier for 48-52 volts.
- 529 power supply designed to power 100 transistor type amplifiers from 110 volts AC.
- 533 power supply designed to power 1 transistor type amplifier from 110 AC. Contains bracket for amplifier.
- A series of equalizers for frequency correction for loaded, non-loaded, and open wire circuits.
- 460A transistor type compressor amplifier, interchangeable with 453-455 type.
- A series of brackets and trays to hold amplifiers and power supplies.
- 7300 telephone repeater panel which may be used for 2 wire-4 wire, 2 wire-2 wire, or 4 wire-4 wire applications, and is equipped with test circuit jacks and accommodates the following plug-in items on standard 19" relay rack—1 rack unit of 1¾" height:
  - Transistor type amplifiers
  - Frequency correction equalizers
  - Hybrid coils
  - Compromise and precision balancing network
  - Relay for loss pad relay switching
  - 4-wire loop back relay for routine testing
  - Repeat coils for simplex or composite signaling
- S-17 program amplifier, best quality amplifier for program circuits.
- A series of microphones, amplifiers, loudspeakers for PA systems.
- A series of hybrid and repeating coils.

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TELEPHONE ENGINEER
AND MANAGEMENT'S

1961

INDUSTRY FORECAST

What's New In Accounting For '61?

ACCOUNTING GUIDEPOSTS FOR 1961

- **Don't expect income tax relief in '61. Since Congress made no move in that direction before the election, it is a sure bet that no action will come from a post-election Congress.**
- **Of course the hearings will continue, but don't expect immediate adoption of some type of replacement-cost allowance.**
- **Changes in account terminology in the Uniform System will come only when telephone companies, associations, and auditors insist that they be made.**

By GARDNER M. JONES*

WHAT changes are there to be in accounting in 1961? It is probably safe to say that there has never been a Revolution in Accounting — and certainly there won't be in 1961. But there will be evolution wherever controllers, treasurers, and accountants are alert to the new ideas around them.

Let's look at some specific areas: Taxation, Depreciation, Uniform Accounts, Methods, Equipment, People, and Auditors' Service. In some of these areas, change cannot originate internally but depends on group effort to move the juggernaut of tradition and practice even a few inches per year. One of these areas of accounting interest where basic change will have to come from governments, prodded by private industry and individuals, is taxation.

Taxation

MAY WE expect changes in income tax relief, either in the form of rate revisions or reform in exclusions and deductions, in 1961? The answer is *No*. Since the Congress took no move in this direction during a pre-election session, it is a sure bet that no action on tax relief will come from a post-election Congress. It is conceivable that in the case of a severe economic decline the Congress might act to reduce taxes, not out of any conviction that existing rates are confiscatory, but out of a desire to create economic activity via the consumer spending route. In the absence of that unhappy national condition, we cannot anticipate any tax rate relief, or for that matter, any substantial changes in tax procedure for 1961. Similarly, there is no property tax relief in sight for telephone companies in the near future, nor for any of us. We have new schools (and a need for more), new water and sewer plants, and new public buildings, and they must be paid for.

Depreciation Allowances

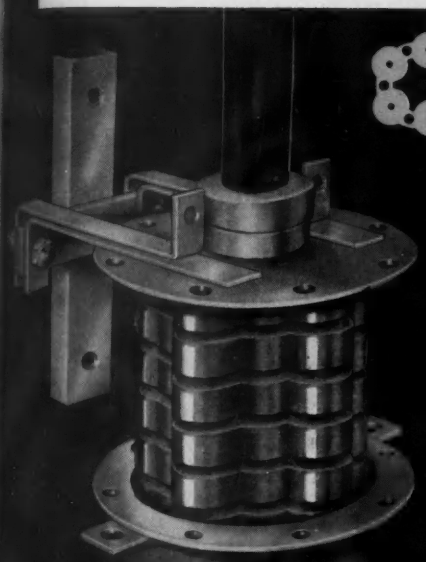
DURING November and December, 1959, the Mills Subcommittee of the Ways and Means Committee of the House held hearings on depreciation reform for tax purposes. A great variety of proposals were presented by dozens of authorities in the field. No resulting action was taken by Congress in the past session. It is likely that in 1961 further hearings will be held and some start made on committee formulation of definite proposals for moving toward some type of replacement-cost allowance. With the long slow movement of legislation through its normal channels, and with the compromises that emerge, we cannot expect to see any changes made in 1961 that will have any effect in the same year.

Uniform System

SOME minor changes are due in prescribed systems of accounts, particularly in terminology — but don't expect them. Accounting terminology, as developed

*Doctor Jones is associate professor, Accounting & Financial Administration Department, Michigan State University, East Lansing.

It's Expansible!



THE COOK

EXPANDABLE COIL CASE

with 88 mh or 44 mh LOADING COILS

LOADING COIL ELECTRICAL PROPERTIES

Type of Coil	CHARACTERISTICS							
	Nominal Inductance (MH)	Inductance Unbalance (%) Maximum	D.C. Resistance (Ohms) Maximum	D.C. Resistance Unbalance (Ohms) Maximum	Effective Resistance (Ohms) Maximum	Dielectric Strength Between Winding (D.C. Volts) Minimum	Insulation Resistance (Megohms) Minimum	Cross Talk Loss Between Adjacent Coils (Decibles)
613-344	44	.5	5.4	.2	7.1	10,000	10,000	90 or Greater
614-343	88	.5	9.0	.2	11.0	10,000	10,000	90 or Greater

COOK ELECTRIC Company

2700 SOUTHPORT AVENUE CHICAGO 14, ILLINOIS

among CPA firms and non-regulated industry, has moved along. The 1936 uniform chart of accounts which your company uses was right up to date in 1936, but no longer is.

Particularly, the misleading word "reserve" in regard to accumulated depreciation should be abandoned; it connotes the existence of money set aside, which is almost never the case. Similarly, "earned surplus," is no longer used by accountants who wish to avoid giving the erroneous impression that here is some extra money lying around ready to be divided among the officers. A review of a dozen or so published annual reports from various kinds of businesses will show a variety of alternative titles, the most common of which is Reinvested Earnings.

Similarly, there is a Capital Surplus account ("Other Capital Surplus") provided for in the Uniform System, which implies that the company has some extra capital it doesn't need — certainly not a likely circumstance. The account is intended to show miscellaneous contributions of capital. Why not label it exactly that?

Some items need re-classification, too. For instance, why should Discount on Capital Stock and Discount on Long-Term Debt be treated as Deferred Charges? Are they really assets, or a means of showing that something less than the nominal amount of stock or bonds was actually received? It is difficult to rationalize the classification of Premium on Long-Term Debt as a Deferred Credit — a category which is generally considered to consist of unearned income, to be recognized as income at the appropriate time. It appears thoroughly logical to attach these accounts to the same categories as the item they are related to.

These are only minor corrections, but they point up the necessity for periodically reviewing the accounts that are in use to see that they are still appropriate to their uses.

There is nothing to bar your company from showing these things for what they really are, in your reports to employes and stockholders. Changes in account terminology in the Uniform Systems will come only from insistence by your companies, your associations, and your auditors. This is something that the Accounting Committee of USITA and the Committee on Terminology of the American Institute of Certified Public Accountants should be working on together, by virtue of their common interest in improved accounts and statements.

Accounting Methods and Equipment

ORGANIZATION for doing record-keeping and the question of suitable equipment are inseparable. Whenever we talk of equipment for accounting (cost accumulation and allocation) use, we can also talk of commercial use, i.e., billing, because much of a given set of mechanical equipment can be used for both purposes.

Let me start off by saying that there will be nothing radically new in the accounting equipment field for 1961. But for most of our companies, there doesn't need to be something new; we haven't even begun to explore the many ways there are to use the equipment already available. A lot of us should direct our attention in 1961 to finding out all we can about the present aids to accounting that are already here waiting for adaptation to specific problems.

For instance, have you investigated the use of microfilm to save paper, time, and file space for customer transaction records and payables records? Your Burroughs or Recordak supplier can show you how other companies have made profitable use of microfilming, especially in connection with cycle billing. You don't necessarily need to have all the equipment yourself (except a microfilm reader) if you can economize on a shared-time or rented-time arrangement with another user.

How about punched paper tape and edge-punched address cards, used with a Friden Computyper for customer billing and revenue account accumulation?

ACCOUNTING AIDS

- **Microfilm to save paper, time and file space for records.**
- **Punched paper tape and edge punched address cards for customer billing and revenue account accumulation.**
- **If you are spending more than $15,000 a year for billing and record maintenance "you should take a good look at tabulating methods."**

Friden, Burroughs, and National Cash Register, all have equipment of this sort which will cut hand-posting errors, save a considerable amount of accounting data accumulation time, and do the billing work of four persons at a cost equivalent of two persons. Again, there is the shared-time possibility if your operation is too small to warrant the full cost of such a system. Have you investigated?

What about punched cards? IBM's "Thrifty Fifty" series is made especially for smaller companies. If you are spending more than $15,000 a year for billing-subscribers' accounts, cost accumulation, and report preparation combined, you should take a good look at tabulating methods. Furthermore, if Independents are within reasonable communication distance of each other, and together spend over $18,000 a year for these purposes, they should consider a joint installation to service their needs together. It will be a minimum installation that will do the routine jobs, but do them uniformly and reliably. Smaller firms often can obtain the use of punched card methods economically through nearby tabulating service bureaus. Have you investigated?

One of the costly nuisances in tabulating applications in the past was the need for manually punching cards from written report sheets or tickets. This was reduced

Please turn to page 85

a FIRST look . . .

New Airtronics MULTI-PURPOSE, PORTABLE test hybrid set

CHECK THESE SPECIFICATIONS

120 P Repeat coil hybrid, specially adjusted for high trans-hybrid balance

128 type low pass filter

Precision 1% capacity decades on NBO

Internal switching provided for two most commonly used networks

Plug-in network arrangement, compromise net built in

Line and Net simplex leads brought out to pin jacks on front panel for special testing procedures

Convenient panel lay-out, jacks and binding posts to facilitate connection to line or external circuits

600 ohm impedance on 4 wire legs

900 ohm impedance on line, (a built-in switch permits change to 1500 ohm impedance line)

ALSO AVAILABLE

External decade capacitor and variable resistor (3 terminal) for use in locating cable opens, for compromise net, etc.

Plug-in dial to facilitate testing procedures

- **makes acceptance tests easier, faster**
- **locates cable opens accurately**
- **accommodates standard networks**

Now, a completely portable precision test hybrid for transmission engineers and testers — ruggedly built, and packaged for maximum convenience and flexibility. Use Airtronics new Test Hybrid Set for cable and trunk acceptance tests, circuit evaluation, capacity balance tests, acceptance and evaluating tests using Singing Point or Return Loss techniques, plus other specialized applications. Use it, too, to locate — with *Airtronics unique new "Cable Locator"* — some of those "lost" cable pairs currently unavailable for use because of opens! This exciting innovation in telephone test equipment determines, with new accuracy, distance to an open end — by a capacity comparison method, with capacity measured to ±1%.

Modernize — simplify — your testing procedures with the new Airtronics Multi-purpose Portable Test Hybrid Set, Model 20B. It is designed to use standard type 115H or 115AL Precision Networks, available in all toll offices.

another product FIRST from

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TELEPHONE ENGINEER
AND MANAGEMENT'S

1961

INDUSTRY FORECAST

The Commercial Department Looks At '61

REVENUE BOOSTERS FOR 1961

- **Sixty-one may be a better year for you and your company if you: (1) study 1960 and see what changes should be planned for '61; (2) solicit ideas and suggestions from the people who work in the department — not just supervisory people, but the men and women who must use the tools the department provides; and (3) don't be satisfied with last year's revenues — "look at '61 as the year to improve local service revenues."**

By ALLAN R. STACEY*

THIS is the issue of TE&M dedicated to forecasting and planning for 1961. That makes today one in which I ask you lots of questions; questions relating to what you and I did during the year 1960 in the Commercial Department. So, let's take a look at 1960 and see what changes should be planned for 1961.

We should study all of the phases of the Commercial Department's activity, but, because only so many lines of space are available in this magazine for this subject, let's take here just a few examples and you enlarge the list later as you see fit. They say that the past is prologue. Well, what was the prologue in 1960 that will help us to determine what to do in 1961? Here are some sample thoughts.

Service Orders & Cashiering

WAS the service order volume up or down? Should we change the flow of orders through the department as a result of change in volume? Have the service orders changed in type? With all the newer types of equipment such as color telephones, lighted dial instruments, etc., can we streamline the language used on the service order so as to save typing time? Can we reduce the typing on those orders which ask for a single extension? Do we still need as many copies of the service order?

What's happening at the cashiering position? Is the volume up or down, requiring an adjustment in the petty cash amount? Do we receive a greater proportion of our payments in the form of checks than we did the previous year? Does this require a different method of processing? Are we getting high usage of the return address envelopes sent out with the bills? Could we use a change-making machine or a posting machine at the cashiering position in light of 1960 volumes? What was our record of accuracy in change making? Does our cashier need additional training? Are our practices for safekeeping of money adequate? Should we increase or decrease our burglary insurance or our fidelity bonds?

Desks And Telephone Lines

ARE the desks used by the service representatives adequate for today's job? Should they be changed in size, style or relocated in the office? Do they adequately house the subscriber card record? Should we change the size or shape of the subscriber card or the method of preparing it? For example, should we start typing it if we have been using long hand or should we stop typing and go to the long hand method? Some companies have made the startling change of going back to long hand — for very good reasons. What safety hazards have developed around the desks and chairs in the department during the past year? Are the desks still in the right location for today's traffic flow?

Is our incoming telephone service adequate? Do we have enough lines and do we properly man those lines?

Please turn to page 78

Mr. Stacey is vice president of the Sunland-Tujunga Telephone Co., Sunland, Calif.

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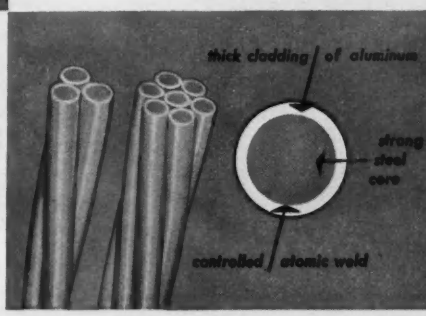

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nufacturers of telephones, switchboards and related apparatus since 1907

What does the telephone equipment we are using look like? Is it modern? Does it make the right impression upon the customer who comes into the office?

Well, you can see now what we have in mind when we say ask questions about each phase of the commercial department's activity. In addition to questioning each phase of activity, we should ask some general questions.

General Questions

DOES the office look old and tired? Do we need a new coat of paint or new floor tile? Are we displaying our wares properly? Perhaps we should borrow from another company or from a telephone supplier a more eye-catching display piece for the latest style telephone instruments. One office I visited recently was using a small motor driven ferris wheel to display the Princess type telephone.

Looking at the most important part of our commercial office — our people — do they need more training in any specific part of the business? Do they need a better understanding of the department's objectives?

Now that we have studied 1960's conditions we should use them as a springboard for improvement in 1961.

What's For '61?

WHAT is going to happen in 1961 within the limits of our ability to control it? May I make three suggestions? First I recommend that we make a list of the improvements suggested by our study of 1960 activity in the examples above. Let's itemize the necessary improvements and then work on them one by one. This doesn't mean that all of them will be accomplished in 1961 but those which are not completed can be carried over into 1962. I keep in my desk drawer a list entitled "Stacey Objectives." Being human, I don't always accomplish each objective on schedule, but having the schedule before me and coming up for review regularly, focuses my attention upon ultimately reaching these objectives. So it can be with your department. Perhaps you should have a list entitled "Commercial Department Objectives" with some items dated for completion and others with an open date.

Second, I suggest that we include in the forecast for 1961 something which might be called "Operation Sit Down." Sit down and solicit ideas on all of the objectives from the people who work in the department, not just supervisory people but the men and women who must daily use the tools that the department is providing. Why not schedule a date and time right now for such an interchange of ideas.

Third, in our program for 1961 should be ways and means of increasing revenue. Just as a boy growing into his teens seems to need more and more food for healthy growth, so does our telephone business require new and additional revenues in order for us to provide ever-improving service to the public. If we are going to stay healthy and prosperous we must not be satisfied with last year's revenues. So, how about a slogan "This is the year to improve my local service revenues."

REVENUE BOOSTER

- **Select one man and make him responsible for improving exchange revenues in '61.**
- **Set a reasonable goal. If you have 1,000 stations you should be able to increase local revenues by $2,000 annually.**
- **Demonstrate an interest in the results.**

I have heard telephone men say, "I can't increase my local service revenues because my station gain is dropping. It is only half what it was last year." Other telephone men have said to me, "How do you expect me to increase local revenues when I have no station gain whatsoever?" Gaining local service revenues simply by gaining stations is the easy way. It is possible to improve your local revenue in a far greater proportion than your station gain.

How To Increase Local Revenue

HOW, then, do we go about increasing local revenues? I cannot here outline elaborate sales programs or long lists of new types of equipment which will provide more income or success stories entitled "How I Doubled My Exchange Revenues In Three Easy Lessons."

However, I have one suggestion — that you select one man in your organization and assign to him solely, specifically as his *first and only responsibility* the objective of improving exchange revenues in 1961. He may be a supervisor or he may be a commercial representative or he may be any other person with reasonable ability. In the event that you are not large enough to assign one man full time to this responsibility I suggest that you assign a specific number of hours per week on the part of one employe.

Tell this man that it is his job to introduce ways and means of improving local service revenue. Together with him set a goal for 1961. What is a reasonable goal for revenue increase in 1961? Try $2.00 per main station per year. If you have 1000 stations you should be able to increase local revenues by $2,000 annually during 1961. Many companies are using $3.00 and $4.00 per main station.

See that management demonstrates an interest in the results obtained by this man. Checking the results will encourage him to greater effort. In other words, as John D. Rockefeller used to say, "Put all your eggs in one basket and then watch the basket."

Well, my friends, there's the challenge for 1961. Good luck to you. Let me know how you come out. — *Allan R. Stacey.*

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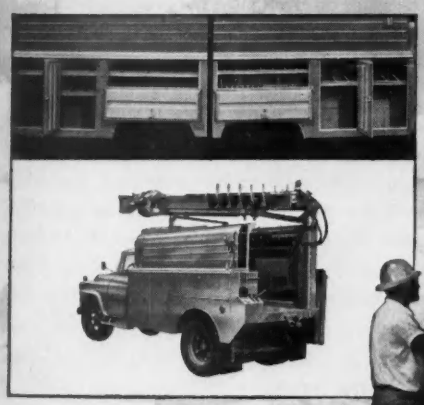

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New Traffic Measurements For '61

TRAFFIC IN 1961

- **If 300 board hours were required to meet the service requirements under the old coefficients, the new coefficients will require the same number of hours — but there will be fewer units.**
- **When cost remains constant and the units are reduced, the cost per thousand units is bound to increase.**
- **Early in '61, each Independent company should discuss the details of the new coefficients and their use with the proper Bell System Company.**

By D. A. PERIGO*

THE NEW traffic measurements which we are about to discuss will be limited to efficiency, or as it is generally referred to — *Load*. In order to be sure we are all speaking the same language perhaps we should first define what is meant by load. To do this requires that we recognize the meaning of *unit, coefficient,* and *hour,* so here are some definitions:

UNIT: — This is a measurement of time. Historically it is the result of dividing 3600 seconds (1 hour) by 230 which, if memory serves us correctly, was the average number of calls an average experienced operator could complete to the multiple of a W. E. No. 1 local manual switchboard in one hour. It is the equivalent, then, of about 15.65 seconds.

COEFFICIENT: — This is a multiplier which, when properly applied to the various kinds of calls, establishes them on the common denominator of UNITS. Basic coefficients are established as the result of work time studies. The *weighted coefficient* is determined by application of the established individual coefficient to each work item and dividing the total units so obtained by the number of originating calls. This is sometimes referred to as "Units per Call."

HOUR: — This is the measurement of the time spent by central office employes.

LOAD: — This is the measurement of the office efficiency. The load, or efficiency, is obtained as follows:

Calls × weighted coefficient = Total Units
Total units ÷ Hours = Load

Mr. Perigo is general traffic superintendent of the West Coast Telephone Co., Everett, Wash.

Less Worktime Per Call

IN RECENT years there have been many changes in both equipment and operating practices. Generally speaking, these changes have resulted in less worktime per call. Under the old coefficients when board loads began to substantially exceed 230 units per hour it was obvious that operators were "beating the coefficients."

Some of the practice changes were being made on a progressive basis. Recognizing this, any coefficient studies made in the interim would have been outdated before they could be summarized. Some of us uninitiated were, of course, impatient at the delay but we were not in a position to make studies of our own because the number of observations required would be entirely out of line with the amount of traffic handled.

We will not discuss the changes in the individual basic coefficients because this would merely repeat information which is obtainable elsewhere. Except for a couple of fundamentals we are interested in the result of the changes.

We had a theory that under most of today's operating conditions the only difference in the toll coefficient for a particular type of call should be the time required to key, or dial, the three additional digits required on calls

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beyond the home Numbering Plan Area. This was the same thing as saying "a dividing line of 30 miles is meaningless." It also says that going across a state line may mean nothing. Others shared our theory. Some who have had a great deal of experience with practices and coefficients theorized that, with key pulsing, not even the numbering plan area should make any difference worth bothering with.

Under these circumstances it is understandable that when we first saw the new toll coefficients we were quite disturbed to find that not only was the 30-mile break still there but another one had been added at 1000 miles. We asked for the opportunity to review the studies which developed the new coefficients and spent several hours with John Ogg and Craig Collins at Bell System headquarters — the fellows who set up the studies, did the summarizing, and reached the conclusions.

We probably used a one word question an excessive number of times that day because we kept saying "Why?" The answers always seemed to be "We don't know why. All we know is that here are the facts."

We were quite impressed because there is no way that a *fact* can be argued against. We can theorize to our heart's content but it doesn't change the facts. It is a little frustrating not to know why — but just think how many thousands of years it took our ancestors to find out *why* the sun *rose* in the morning and *set* at night.

Having gone over the details of how the studies were made, summarized, and tested we had to accept the facts. Maybe some time the reasons for the facts will become apparent.

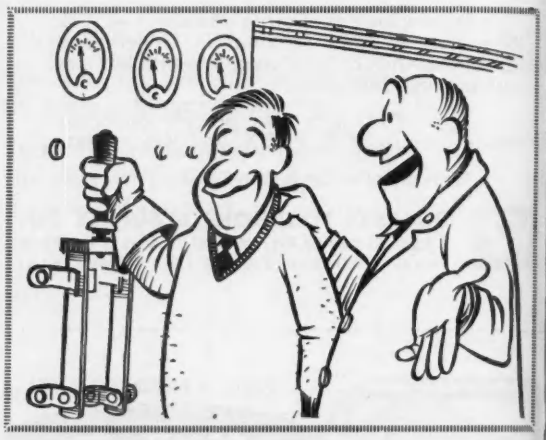
Team size factors were previously used in an attempt to make office comparisons feasible. This is a point we have argued before, stating that such load figures did not represent the facts. We are happy to see these factors generally thrown out.

In October 1954 we presented a paper on "Responsibility Accounting in the Traffic Department" at the USITA Traffic Conference. In some of the charts we showed loads which some people thought were low. We explained that the loads shown were the result of dividing the total units for the *month* by the total hours used rather than for weekdays, because we thought such loads came closer to representing the facts — but could not be compared with those in other companies. We understand that the official load figures of the Bell System were placed on a Calendar Day basis in October 1960. We are sure such loads will come much closer to representing the real cost of operation.

The coefficient changes, along with other changes of lesser consequence, were expected to reduce the board loads from 25 to 35 points. We have done some checking with widely separated areas of the Bell System after the first month on the new basis and find that the expectancy was reasonably close on an area average basis. Figures for one month should never be considered as representative or conclusive. Independent company people should be aware of another reason for refraining from comparisons. In one area where the average (unweighted) load dropped 28 points the individual offices ran from seven to 57 points less. Elimination of team size factors and a wide difference between Sunday and weekday traffic could be substantial contributing causes to the large point spread.

As pointed out in Traffic Lights in the 12-15-60 issue of T. E. & M. we don't believe in comparison of one office with another. The use of the new coefficients along with other factors we think will demonstrate the truth of what we wrote much better than we were able to say it.

Let's examine one other item. If it required 300 board hours to meet the service requirements under the old coefficients it will require the same hours under



"Go ahead, its your cutover — you pull the switch!"

the new coefficients — but there will be fewer units. This means that if your top management looks at a Traffic Item known as "Cost per thousand units," you better let them know what's going on before the roof caves in on you. When the cost remains constant and the units are reduced, the cost per thousand units may go up pretty fast in some offices.

We do not propose to get into the matter of the effect on toll settlements except to say that unless there is something special about where the 1000-mile breaking point occurs for a particular office it may change some distribution figures. We don't know of any way to predict this without making a Traffic Unit Study (Supplementary Peg Count).

We have been assured that each Bell Associated Company will be glad to discuss the details of the new coefficients and their use with any of the Independent companies. We urge the Independents to take advantage of this offer.

We appreciate the helpfulness of some Bell System areas in furnishing us with advance information in order to meet our deadline. Since some of the information was provided hurriedly and before complete analysis could be made, we refrain from mentioning their names but they have our sincere thanks. — *D. A. Perigo.*

"Growth Continues"

(Concluded from page 46)

(3) The telephone market is not saturated; over ten million homes are without phones, and recent estimates state the rate of household formation in the next 15 years will be considerably larger than in the last 10 years, and may reach 57 million.

(4) Daily use of the telephone for long distance calls has jumped from 240,000 per day in 1920 to over 3,000,000 per day last year.

As we see it, such factors and many others we could list, if we had the necessary space, were behind the telephone industry's ability to weather the mild business downturn of 1960 and wind up the year with: (1) only a slight slowdown in the rate of revenue increase brought on by a decline in business calls; (2) rising revenues; (3) climbing earnings; (4) better-than-ever dividends; and (5) mounting expenditures for service improvements and expansion.

And, from our study of reports forwarded to us by the nation's telephone companies we find nothing to indicate any lessening of the industry's upward trends.

We do find evidence of the industry's determination to continue its program of research and automation as a means of further improving the speed, the accuracy, and the convenience of telephone service, increasing its usefulness and broadening its scope.

In the years ahead, as in the past, there will be an advance in the quality and a great increase in the quantity of telephone service. Some of the changes just around the corner are increased capacities for existing cables, improved high-frequency radiotelephone linkages, versatile electronic telephone exchanges, radiotelephone communications using satellites, and the introduction of new devices that will build new business and residential markets for communication services. — *John G. Reynolds.*

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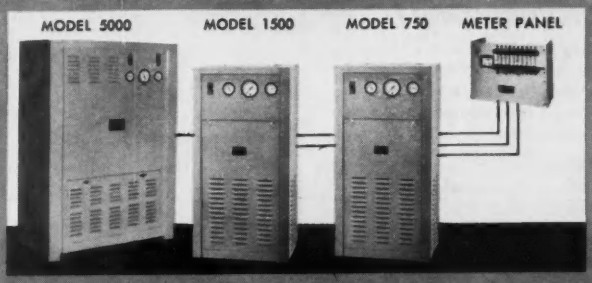

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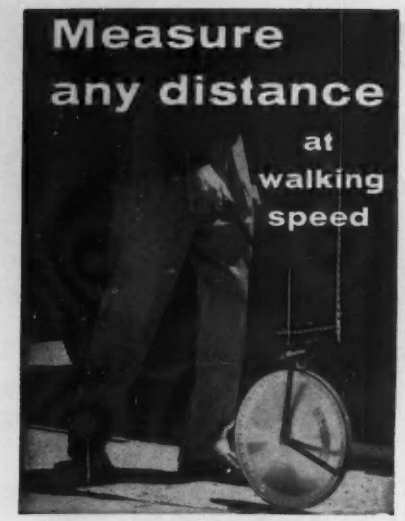

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Rolatape
Measuring Wheels

"The Small Company Job In '61"

(Continued from page 50)

in addition to the billing. Such companies will have the problem of producing the new kind of tickets — either automatic ticketing machines producing some sort of toll ticket, or operators producing some sort of toll ticket, or both.

And in general, and sooner or later, such tickets as are produced will of necessity be the punch card or the mark sense type. Otherwise, the collect, third station, and credit card tickets which you produce and send to someone else for billing, will not be easily billable by those companies and they will start putting some sort of pressure on you to give them tickets which they can intersort and process with their other tickets.

Also, most of the tickets you eventually get from other companies and have to bill to your subscribers will be tickets that will be easily machine billable, but very difficult if not impossible of manual billing. Toll centers therefore will have the problem of buying or renting their own automatic ticketing machines and equipment, and this should be a very carefully planned and coordinated step. The closest possible cooperation and coordination between you and your connecting company is imperative.

Dial Operation — A "Must"

ALL of this discussion so far presupposes a fact which may not be true — and that is that you are already, or shortly intend to be, 100% dial. Even after DDD and automatic ticketing are wide spread, it will be possible to operate as a magneto or as a common battery office. But it seems to me that, completely aside from public demand which you may or may not have for conversion to dial operation, economic pressures will eventually force you into dial operation.

For example, the differential in the toll settlement schedule (now generally in effect between Bell and Independents) favoring dial operation over manual, is but a hint of the direction this thing is going. Just by common sense, your connecting company must charge you more, in one form or another, if you have to provide an operator to intercept long distance calls incoming to your exchange, signal your office on a ring-down trunk, and then take down the connection when the conversation is over.

Likewise with the company which originated the call. If it has to take the time to manually establish the trunk to your subscriber, it is going to want — and deserve — extra compensation. And we have not even mentioned all the other factors indi-

ANNUAL REPORTS

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cating the necessity of dial conversion, such as increasing operator costs, increasing public demand, and so on, all on top of which are the new pressures created by DDD.

Many people would argue that feasability of manual operation ran out a good many years ago, but 1961 is producing the factor which puts the clincher on the proposition.

There are other things we might talk about in describing 1961 as a "different" year, but in my opinion DDD is the *big* item, the *big* problem, and the *big* opportunity in this new year. — *Bill Corman.*

"Accounting

(Continued from page 72)

somewhat by the use of dual-purpose cards, where information was written on a partially-prepunched card itself by the installer, stores clerk, or whoever was recording it. The key-punch operators then punched data from this card into the same card. Now we have gone one step further: the installer or field man carries a "port-a-punch," containing a partially prepunched card; he records information in this by punching out holes with a stylus. It is simple enough to use that Air Force men use it for inventory-taking. This seems to have promise for easy recording for milkmen making deliveries, stores-keepers recording requisitions, telephone installers and repairmen, survey takers, etc., where the on-the-spot recording consists of only a few digits of information. Punched cards are worth taking another look at!

How is one to evaluate the claims of equipment manufacturers? The answer is, if you can't, don't try to! Call on an independent outsider, your CPA firm. You expect each maker of equipment to try to convince you that his system will fit your needs. The best way to avoid confusion on this score is to outline your problem to each one; give him the information on volume, due dates, and so on; and require a written proposal, complete with costs. Then let your independent CPA, who has no interest in any particular equipment maker,

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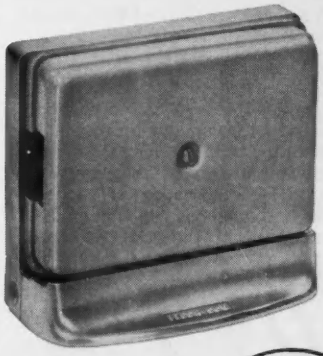

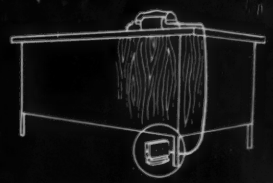

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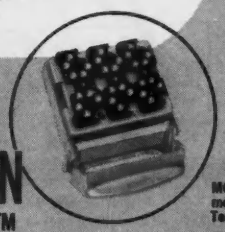

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MODEL 102 shown with standard telephone equipment, accommodates up to 6 No. 44-A Connecting Terminals (3 on each side).

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Or, the back of either model can be used to install external ringers, buzzers or auxiliary equipment.

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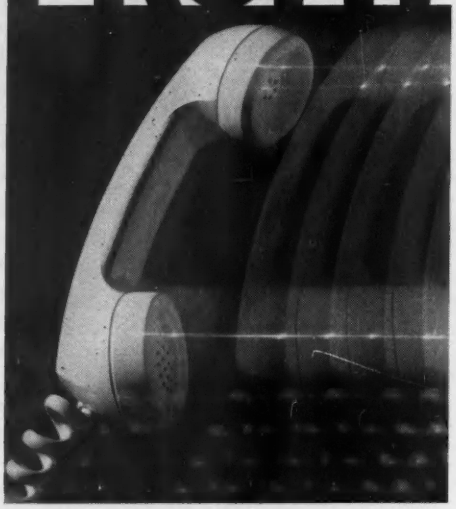

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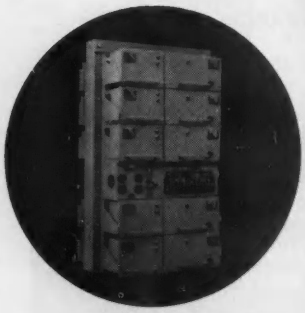

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evaluate them and discuss the why's of his conclusions with you. It is your final decision, but you have the benefit of an independent, experienced, outside viewpoint.

Not every CPA is qualified to judge systems proposals, any more than every M.D. is qualified to diagnose and treat diseases of the bones. If the firm which does your annual audit is lacking in this kind of experience, ask them to recommend a competent source. The professional fee is cheaper than self-treatment!

Developing Your People

IT'S TIME, in 1961, to take another look at your most valuable accounting tools — the people who do your accounting and record-keeping work. How long is it since you have really seriously considered the use you are making of the skills they have? What are the skills they could develop and cultivate, with a little help from the company and especially from the boss?

If your company's hiring and pay policies, and its attitude toward its employes succeed in attracting real people — not dolts nor bird dogs — then every further investment in an employe to broaden and deepen his knowledge or skill will pay off. Give them a chance to grow, and watch the results.

Accounting employes need to be exposed to work simplification ideas, cost accounting, statistical quality control, improved English usage, writing, elementary telephone circuitry, marketing and promotion methods. Do they have a chance to do it, either by night classes, adult education programs, correspondence courses, company classes, rotation of assignments, or specific project assignments which require digging into new subjects?

Upgrading of abilities cannot be left to chance or employe initiative — it needs a continued gentle push from the company and the boss. Along with specific training goes the need for association with others in professional organizations. Your accounting employe who is active in the local accountants' association or the local chapter of the National Association of Accountants is no longer "a fellow

who works for ABC Telephone Company." He becomes "an accountant, who works for ABC Telephone Company." He develops more professional pride — and he swaps ideas with other accountants. Telephone company accountants are not a breed apart, although the scarcity of their names on the rosters of professional accounting groups would lead one to that conclusion. Begin to mingle in 1961!

Services of Independent Accountants

MOST of our companies call in a CPA firm once a year to conduct an audit either because it is required or because it is expected. Many clients are unaware that the range of services of the CPA extends far beyond auditing and tax reporting. The CPA's usefulness in evaluating systems proposals was indicated above. In recent years, CPA firms have been involved in such diverse questions as improved control of inventories, paper work procedures for customer, complaint, service order, and equipment maintenance activities, scheduling of trucks, economic studies for equipment replacement, depreciation methods, sampling plans for property accounts and for control of clerical activities, and so on.

Not every CPA can handle every one of these specialties, but if not, he can recommend a specialist who can. 1961 is a good time to begin looking toward the use of the independent accountant, the CPA, for help in many of these areas which are a little beyond the skill or experience of your own personnel.

Conclusion

What's new in accounting for '61? Not much, if we are expecting manna from Heaven. But for those of our controllers, treasurers, commercial supervisors, and accountants who will but look around them, there is a whole range of new uses for already existing techniques and methods and equipment. And there are some renewed opportunities which have been suggested here, to make better use of already available human resources.— *Gardner M. Jones.*

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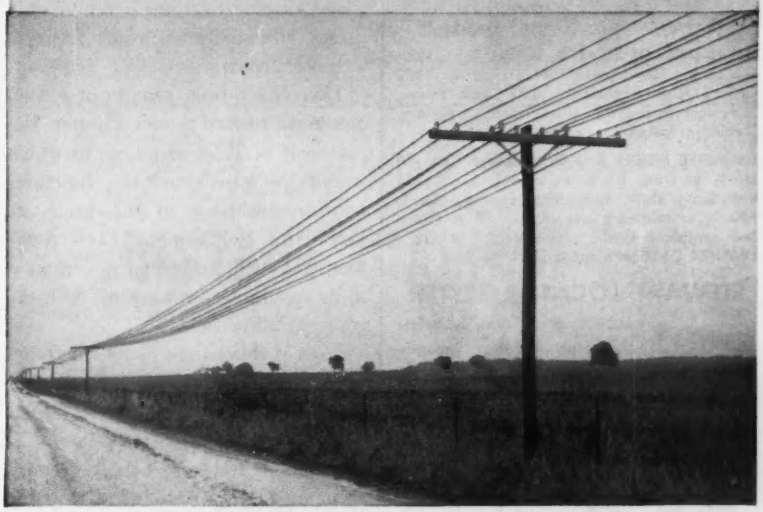
High Tensile Line Wire

MADE TO WITHSTAND HEAVY STORM LOADS

Time and time again, *Crapo* HTL-135 has demonstrated its ability to stand up under heavy ice and wind loads when other conductors failed. This can be attributed to the fact that *Crapo* HTL-135 combines high strength with high fatigue endurance plus superior elastic qualities which enable it to spring back into place when loads are removed. The result: service interruptions are minimized, re-sagging is seldom necessary, where this rugged telephone wire is used.

The excellent telephonic transmission characteristics of *Crapo* HTL-135 make practical subscriber loops of 14 to 15 miles with normal voltages and equipment. Longer loops are possible where higher voltages and more sensitive telephone sets are employed. For dependable, long-span, low cost rural lines, specify *Crapo* HTL-135.



HERE'S PROOF OF DEPENDABILITY

The Crapo HTL-135 in this typical rural line of 300-foot spans was subjected to two heavy ice storms within 14 months. This photo shows the line, without resagging, three months after the second storm.

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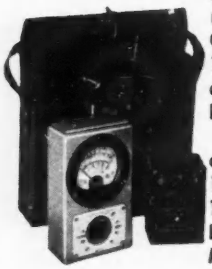

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DB METER MODEL K — in 4 ranges from -20 to + 42 DBM. DB Scale, red; 1, 5, 25, 125 Volts.Scale Black. Frequency response, up to 600 k. c. Minimum impedance, 18 K Ohms. Self contained loads, 150 and 600 ohms. LEATHER CASE with space for Lead Sets.

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(Continued from page 48)

conversion, particularly to unattended community dial offices.

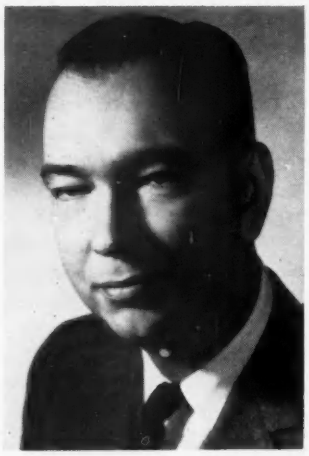
The regulatory agencies: — This is being written without the benefit of any officially released information about the report of James M. Landis, appointed by Senator Kennedy to study the federal regulatory agencies' organization and activities.

It was anticipated, however, that Mr. Landis would propose no sweeping changes in the organizational structures of the regulatory commissions, any newspaper headlines to the contrary notwithstanding. His past discussions of the subject, including his talk to a section of the American Bar Association's annual convention last August, all have been couched in terms of making improvements within the existing framework, rather than wholesale modifications to setups such as an administrative court or new Cabinet departments.

There have been reports of a serious move toward a new Cabinet Department of Transportation, to which would be transferred the functions and organizations of the Interstate Commerce Commission, Civil Aeronautics Board, and other government units regulating or working with the transportation field.

Even if this comes about, there appears to be little prospect for a similar Department of Communications. There have been suggestions in the past looking toward a Cabinet Department of Transportation & Communications, but there is not known to be any strong sentiment now for such a change.

Mr. Landis' suggestions in the past have run more to better appointments of commissioners, more adequate funds for staff personnel, and improvements in administrative processes to cut out "red tape." The odds are felt to be against any immediate drastic reorganization in the Federal Communications Commission, although at some later point the proposed "Hoover Commission type" survey of the regulatory agencies by the Senate Interstate & Foreign Commerce Commission could result in some changes.



Author FRED HENCK is executive editor, "Telecommunications Reports," Washington, D. C.

Another possible move toward future changes at the FCC may come about as a result of a management study of the Commission to be conducted by a management consulting firm — still to be selected, at this writing — under Budget Bureau auspices, to start some time in January.

It should be emphasized that the Budget-sponsored surveys of the agencies stem from a long-term project, going back at least to the latter years of the Truman administration, and do not result either from the recent "ex parte" difficulties of the agencies, or the advent of a new administration. In fact, the FCC was surveyed in 1951 by McKinsey & Co., and among the changes resulting was the present organization of the staff along functional bureau lines — the Common Carrier, Safety & Special Radio Services, Broadcast, and Field Engineering & Monitoring Bureaus.

Toward the end of the year, there had been no indication of Mr. Kennedy's selection as the new Chairman of the FCC, who could be either an incumbent — veteran Commissioner Robert T. Bartley is most frequently mentioned — or Mr. Kennedy's choice to fill an upcoming vacancy on the Commission. Among those from outside the FCC mentioned were Kenneth Cox, Seattle attorney who has served at various times as special counsel to the Senate Interstate &

Foreign Commerce Committee, and Harry Plotkin, former FCC Assistant General Counsel now in private practice in Washington.

It should be remembered, however, that regardless of the identity of the new Chairman, six of the seven incumbent FCC Commissioners will be continuing in their posts, barring some unexpected departures prior to the end of fixed terms. While the FCC Chairman is responsible for general direction of the agency's affairs, he by no means controls decisions, and more than once is found voting with the minority in a split decision.

In any event, the FCC as presently constituted, under the chairmanship of Frederick W. Ford, has not shown any disposition to accept the presentations of large business organizations without extensive questioning.

Thus, regardless of who the new Chairman might be, observers do not expect the Commission to be substantially more militant in its regulatory operations in the Kennedy administration than it has been recently under President Eisenhower.

The economy: — An upswing in the business picture by around midyear is expected to make 1961 on the whole an excellent year for the national economy, after an anticipated relatively poor early start.

As evidenced generally by the year-end statements and financial reports of the communications companies, however, the nation's telephone companies have done well over the recent downtrend in the economy as a whole. The classic example, of course, is the American Telephone & Telegraph Co.'s announcement of a 9% increase in the going dividend rate, and the reports showing that Bell System business, both long distance and exchange, has been going well.

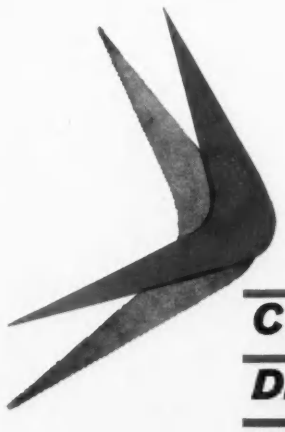
It appears overall, that the telephone companies will be working in 1961 in a climate of good business, under a national administration which will tend in the direction of somewhat higher federal budgets and expanded programs, but with the general population increase and the hoped-for rise in the business picture presumably offsetting the federal budget boost and working against a general tax boost.

Since the Kennedy forces apparently are opposed to a tax reduction as a business stimulant in the expected first-half slump, the prospects appear likely for a stabilized tax level during the year.

Unfortunately for proponents of a reduction or repeal of the excise tax on telephone service — and the supporters of such action are varied and numerous, as we have learned in recent years — the forecast of a stabilized tax level probably applies with equal weight to the telephone impost.

In the Kennedy administration, the point that repeal of the telephone excise will cost the federal treasury a huge amount in annual revenues probably will carry a little less weight than it did in the Eisenhower administration — but it still will be fairly potent.

More controlling, perhaps, against the prospect of reduction or repeal of the tax is the feeling among many of



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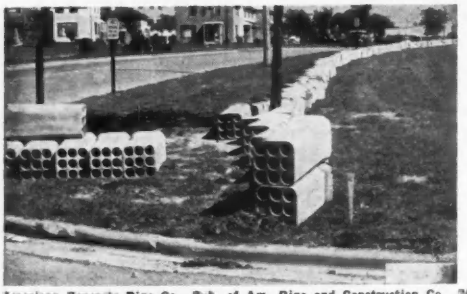

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Washington's influential officials on the subject of government finance and taxation that one or a few excises should not be singled out for action. Instead, they take the position that a general overhaul is called for.

There are, of course, many arguments against this point of view, starting with the obvious one that telephone service is the only household utility necessity which is subject to excise taxes. Which, of course, comes back to the basic theme of this article. A sufficient educational program could overcome the tax theory that a few levies should not be singled out for change — if it is clearly demonstrated, particularly to subscribers, that the telephone tax is one which *should be* singled out.

The Internal Influences

AT ANY rate, so much for the external influences. Internally — which is where, we insist, events are controlled within the perimeters of overwhelming national and international developments — 1961 should be a year of new services, developed, proposed, and promoted by the industry, and the aspects which surround the new services, particularly as to their rates and settlements.

Before getting down to what we expect will be the biggest single telephone industry news "running story" of 1961 — wide area telephone service, with its Washington and state regulatory ramifications — let's talk about the wild blue yonder for a minute.

The year just starting will be one of greatly developing interest in a field which could very well be 1962's biggest story in the communications field — if you will excuse a long, long, long-range prediction — satellite communications.

It may be that one of the most significant documents issued by a Congressional committee last year was the report on space telecommunications made public by the Senate Committee on Aeronautical & Space Sciences early in December.

The report made clear — and subsequent informal discussions have confirmed — that the Senate group will take a long look in the session of

Congress just beginning at the direction in which the United States is headed in the space communications field.

The report, which stressed that the work of the "large number of agencies now having cognizance or jurisdiction over various aspects of either communications or space research and operations" should be much more closely coordinated than it has been heretofore, raised an interesting point for all taxpayers who also have an interest in the free enterprise system.

It brought out that questions have been raised about a speech of T. Keith Glennan, National Aeronautics & Space Administrator in the Eisenhower administration, in which Mr. Glennan said that the use of satellites to provide communications links as part of commercial communications services should be left to private industry, with the government lending assistance aimed at accelerating the practical application of such systems.

The report noted that other government agencies have criticized Mr. Glennan's speech as going beyond NASA's authority in the widely dispersed space field. In reply, the NASA Administrator forwarded to the committee an exchange of correspondence between himself and the Defense Department last August, in which it was agreed that NASA can move forward in the communications field insofar as it relates to "active" satellites. The previous understanding was that NASA would specialize in "passive" satellites for communications — the Echo I reflector type — and that the military would have precedence in the active satellite field, in which the satellites contain electronic equipment serving as an electrical relay system, rather than merely bouncing the signals back to the earth.

The whole satellite communications field, has vast and important significance for the telephone industry in a way much closer to the pocketbook than a philosophical discussion about whether government or private industry will be predominant in the space communications field.

If the FCC's private microwave decision — which vastly broadened the opportunities for licensing of privately owned, point-to-point microwave radio system — is ever to be reconsidered or reversed, such action presumably must come about because of the priority requirements of space communications for frequency assignments, and the paramount necessity for space operations not interfered with by earth communications on microwave frequencies.

Despite the prospects for an extensive investigation of this subject by the Senate committee, and the pending court appeal by the National Rocket Society seeking to remand the FCC's decision to the Commission, not too many observers expect the question to be settled this year.

When those aspects are taken into account, along with the FCC's pending long-range inquiry into space communications, and the pendency of the 1963 international conference on space frequency allocations, it would seem to make a "guesstimate" that

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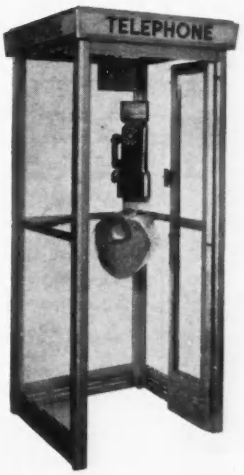

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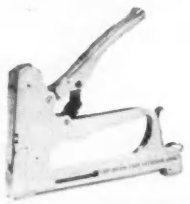

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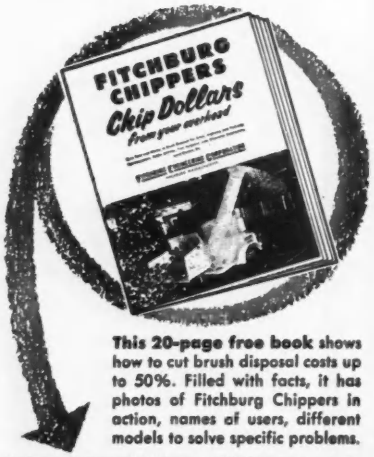

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1962 will be a big year in the space communications field a fairly good one.

Wide Area Service Rates

IN ADDITION to the wide area telephone service tariff, filed with the FCC in mid-December, the Bell System is expected to come up with two major new interstate service offerings, at least, during the coming year.

The company has had nothing to say whatsoever about these prospects. Observers recall, however, that one of the most significant intrastate tariffs by a Bell System company during 1960 was the "group channel" offering of the New York Telephone Co.

The group channel filing was made to enable the company to bid on a system for the New York Power Authority, and the authority's contract for the communications system later was awarded to the New York company. Essentially, it offers broadband channels in groups of 12 voice channels, or 48 kilocycle bandwidth, which may be used by the customer for just about any legitimate communications purpose he desires.

At the time of the filing, it was made clear that the group channel offering, obviously intended for large customers, was in part the company's answer to the competitive effects of the private microwave systems.

The other major new service offering conceivably could be geared to the teletypewriter exchange service field, since the Bell System in the latter part of 1960 announced plans for mechanization of TWX. Because the company has broken ground for the wide area concept in both local exchange and long distance voice services, it would not be unlikely, in the opinion of some observers, that it would propose similar rate treatment for the benefit of TWX subscribers.

As to WATS, the author of an article to appear in the Jan. 15 issue of this publication, but which is being written at the end of 1960, is under peculiarly unfavorable conditions. The interstate tariff was filed by AT&T with the FCC to become effective Jan. 15, so that between the time this is being written and the time it is in the hands of subscribers any protests by interested parties will have been filed, and the Commission will have taken whatever preliminary action it deems necessary.

Not wishing to be accused of lack of courage or foolhardiness, however, we will simply say here that it looks like the U. S. Independent Telephone Association will submit comments geared entirely to the divisions of tolls for WATS service, and that the Western Union Telegraph Co. very likely will raise questions about the level of the rates themselves.

Based on conversations with FCC people, who emphasize that the 30-day tariff filing notice period is not very long to consider the impact of a whole new concept of telephone rate structure, the best guess here is that, if the anticipated comments are filed by other organizations, the FCC will order a hearing. Such action could be taken — and has been, before — without suspension of the tariffs.

The WATS tariff, of course, raises fundamental questions, for which Bell System people undoubtedly have answers which can be presented at a hearing or otherwise. Two raised by the USITA are the economic impact of the service on Independents in terms of revenues and needed added investment, and the impact in terms of increasing operating costs for promotion, and billing and collecting. Both of these, of course, lead to the basic question of settlements.

FCC people informally have commented, after pricing the bills of some typical large users of long distance service against the WATS service, that their impression is that the measured time service would not be too attractive to some customers — remember that the "pricing out" was done on a selective basis — and that the possibility that rates for full-time service conceivably could be too low, in terms of possible subsidization of WATS by users of message toll service, should be studied.

Western Union, one way or another, may well take the position that its private line and message services will be seriously affected by conver-

sion of its customers to WATS use, and it may raise questions about the WATS rate structure itself.

Another area in which the FCC staff informally has raised questions encompasses the WATS service provision limiting it to outbound calls, and barring any person-to-person, conference, collect, or credit card calls, requiring operator assistance.

With the question of Independents' concurrences with the WATS tariff up in the air at the time of the mid-December filing by AT&T, the company did not list connecting or concurring carriers, and said it would supply them by later amendment. Many of the large Independents did not sign concurrences prior to the time of the original filing.

This, of course, leads to questions as to what happens when a WATS customer dials a call through to the facilities of an Independent equipped for direct distance dialing, but not concurring in the WATS tariff, or what steps can be taken to prevent this.

There appears to be no particular reason why the General Services Administration should file a petition with the FCC prior to the WATS tariff effective date, unless GSA is dedicated to a policy of filing petitions about every major tariff change, as some observers suspect. But, if a hearing is ordered, there would be a good possibility that GSA would seek to participate, since the federal government agencies are obviously large potential users of the service.

All of these things should make it evident why we think WATS will be the biggest Washington regulatory news story of 1961.

And since the odds are heavily against any such prediction coming true, we'll make one more, which can't miss. It is this — the next time this writer has occasion to turn out an article of this sort, he is going to fall back on the Drew Pearson, or "can't miss" type of prediction, such as "The WATS interstate and prospective intrastate tariff filings will attract wide interest, and be one of the most discussed telephone industry developments in the first half of the year." — *Fred Henck.*

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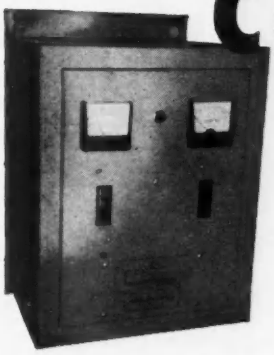

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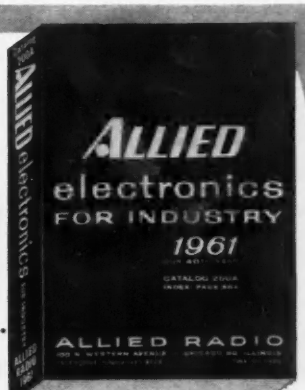

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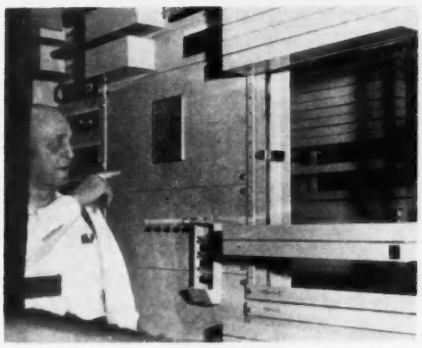
VOLUME 9, NO. 10 • JANUARY, 1961



Carl Daubendiek in 2000-line XY® Dial office that's treated like a railroad man's fine watch. He is pointing to plaque marking first electronic ringer used by a commercial company.

History:

Daubendiek museum at Jefferson, Ia., documents past and present for the future

Carl Daubendiek of Jefferson, Iowa, enjoys sharing his hobby — one of the most complete exhibits of developing telephony. Visitors, including students from high school and college, are numbered in the thousands; telephone people from every corner of the country have planned their route to include the museum.

When you come you'll also want to see the Daubendieks' documentary movie (about 25 minutes) that traces the history of Independents and especially that of the Jefferson company from its founding in 1894 to the present. Allow time to see the fine dial office run by Carl and his two sons, Gene and Bill. You'll enjoy talking to their wire chief and may be in for a surprise.

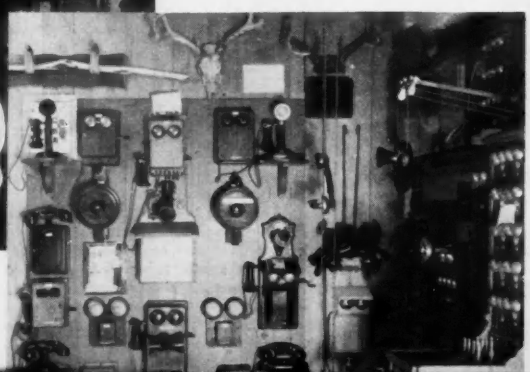
In the equipment room you'll see the plaque designating the first electronic ringer used by a commercial company. This office is where the Sub-Cycle had its field trial. The company was the first Independent in Iowa to offer mobile service with connections nationwide. Quite a bit of history was made right here.

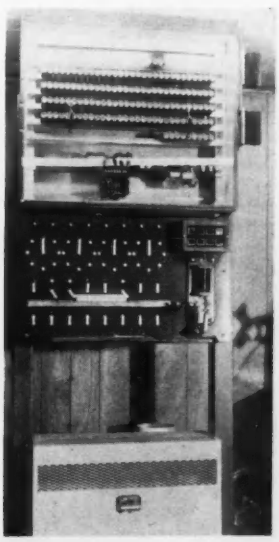
Carl says that he is "now starting his second 60 years in the telephone business;" at 5 he substituted for his sister on the switchboard located in their home in West Bend, Ia. In 1938 the citizens of Jefferson invited the Daubendieks to come over and run their company; it's been a family enterprise since then, town and company growing together amicably.

(Left) Carl projecting excellent documentary film of Independent history, using corner of museum for showroom.

(Below) Just a few of the hundred of pieces of telephone apparatus in the museum. Trophies are the telephone man's favorite sport.

Bay of "firsts" includes (center) authentic copy of country's first switchboard at New Haven, Conn.; (bottom) first Sub-Cycle for decimonic ringing; (top) invention of Gene Daubendiek for conversation timing.





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The approaching end of a storied era:
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What seems to be repetition on these pages is deliberate. The local operator — still the symbol of telephone communication — deserves her applause before the curtain falls on an era. All over the country the same script is being followed; only the actors differ.

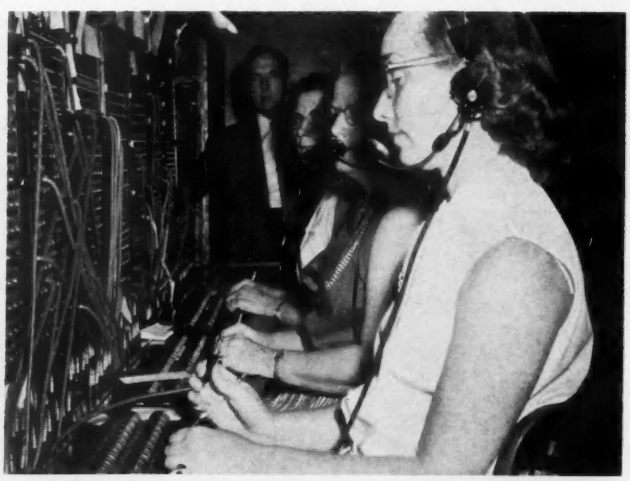
The changeover to dial is no longer a question . . . just "when" and "how" are left to be decided. The pressures of progress and economics have reduced the time factor to the immediate future for Independents who want to survive. The choice, then, is in the manner of financing and equipment.

It is an interesting fact that over the last ten years more small companies have been assisted by the Stromberg-Carlson Credit Corp than through all other private plans combined. And during this same period managers have ordered more XY Dial offices than any competing type. This is clear preference based on proven performance.

Milton Junction, Wisconsin **— Located astride the line separating Milton and Milton Junction, the Milton Telephone Company serves both towns. Although it is a separate corporation from the North-West Telephone Company of Tomah, Mr. Harris Allen is president of both companies, as well as a director of U.S.I.T.A., the University of Wisconsin (his Alma Mater), and treasurer of 100-year-old Milton College — a liberal arts school founded by Seventh Day Adventists. Mrs. Dolores Smith is the chief operator, shown with four of her girls at the present Milton switchboard — purchased from Mr. Allen's close friend and fellow U.S.I.T.A. director Milton Stewart of Cornelia, Georgia.**

Monroe, Wisconsin **— When Miss Margaret Burgi assumed managership of the United Telephone Company there were less than 700 stations. Now there are more than ten times that number. Cheese is king here, and many service industries and professional workers are supported on this base. Also a large brewery makes a fine product under twelve different labels. The transition to dial service has been planned by the Telephone Company's own capable engineering group. As Monroe becomes even more important as a toll center, local operators will move to positions on the new expanded toll switchboard. Recently the city dedicated a new park to General Nathan Twining, who flew in on the F-80 Sabre Jet now dominating the site, as well as a new $1 million school.**

Onamia, Minnesota **— This town at the stouthern tip of Mille Lacs Lake is just one of the areas where a skillful manager, assisted by the complete services of the Stromberg-Carlson Credit Corp., has achieved personal success while bringing to his subscribers the good service they wanted and needed. Dell Ludenia remembers — for it was not so long ago — when he could easily walk his entire right-of-way. Now the properties cover several separated counties. Mrs. Edna Osborn, chief operator, assists Margaret Ludenia (summer help) and Jean Wood at soon-to-be-replaced manual board at Onamia, one of five exchanges completely circling this large lake.**



Kincardine, Ontario **— In this Canadian town, located on Lake Huron northwest of Toronto, is a switchboard that may easily be unique; the first — and we believe the only — multiple magneto board built by Stromberg-Carlson. Even today the service is above average, although the recent location of a huge atomic power generating plant within the territory of the Bruce Municipal Telephone System has caused Mr. Norman Jones to give critical appraisal of his equipment and plant in relation to these very different requirements. The changes in the next few years may equal the accumulated changes since organization of this company in 1911.**

for most of these towns

Exeland, Wisconsin — The white pine logged out of this section of northern Wisconsin built the Weyerhauser lumber fortune and provided a sizeable part of the endowment of Cornell (N. Y.) University. Mr. Conrad Preston bought four struggling telephone companies, combined areas and now, through an R.E.A. loan, has a self-sustaining property with about 900 stations. Mr. Preston is actively promoting new industry that will keep young people from migrating; also the establishment of a National Park to develop the wilderness areas for the greater enjoyment of all. Mrs. Margaret Holquist was the operator before cutover to XY Dial.

Blue Earth, Minnesota — Eldon Eckles was raised in the telephone business, replacing batteries for magneto telephones when he needed a chair to reach the battery box. His son is following suit and a daughter is in this switchboard group (though hidden). The new building for XY Dial and Toll Center was almost ready for roofing last August. Properties cluster around Blue Earth, with additional exchanges at New Prague and Shell Rock, Iowa. The blue clay, underlying the rich black topsoil that supports agricultural abundance, was thought by an explorer to be copper; a whole shipload was sent back to France only to prove worthless.

Spooner, Wisconsin — One of several large towns about to be converted to XY Dial by the North-West Telephone Company, Spooner is center for a vast, unspoiled sportsman's paradise and vacationland in upper-western Wisconsin. The colorful lumbering days associated with the Paul Bunyan saga are over; agriculture and the service businesses are the year-round mainstay between the seasonal influx of vacationers from southern Wisconsin, Illinois and Iowa. Mr. Tom DeWitt came to Spooner in 1931 as local manager for North-West after several years with Wisconsin Bell. Mr. August Steinhart is general manager of the company.

Weyauwega, Wisconsin — The Weyauwega Telephone Company, like the town itself, is very much the creation of Mr. George H. Dobbins, although present management is in the capable hands of Harold Olson, president and manager. The name is Indian for "Here we rest," but the town is not at all interested in resting on its laurels. Industry is in part regional: Wolf River Sausage, Wagner and Fremont Cheese. There is also a company specializing in springs for baby cribs, another making gun parts. With natural gas now available, more industry is expected. Two of the company's exchanges are already XY Dial, with the city itself to come later. Station growth presently exceeds population increase.

Kellogg, Iowa — This is not a large town, but until quite recently there were 26 incorporated companies providing service here! Mr. Jay Autin, president of the merged company, worked long and hard to bring strength and progress through combination. The Stromberg-Carlson Credit Corp. had especial reason for wanting to place XY Dial in this town. Many work in nearby Newton, and in the local Midwest Stamping Company, but the area is typical of rural Iowa. At Rock Creek Lake one customer wanted service over a 7000-ft. line; three pairs were put in, and now other cottagers are getting the fever so that capacity may have to be boosted by subscriber carrier. Ruth Schultz (standing) is company secretary, Thelma Hill, operator.

Wellman, Iowa — This is another small Independent where the future looks good for company and townspeople alike because of assistance from the Stromberg-Carlson Credit Corp. This is a true mutual — every subscriber owns a share in the company. It is also Mennonite country where hard work and thrift are still preferred, but — contrary to popular belief — education and progress are encouraged. Gene Eash, young manager here, worked with an electrical contractor for many years — put himself through college by working from 7 P.M. to 7 A.M. Mrs. Elizabeth Wright, chief operator, and Gertrude Griffith work the present manual board.

Standard F-80 in S-141 Hut

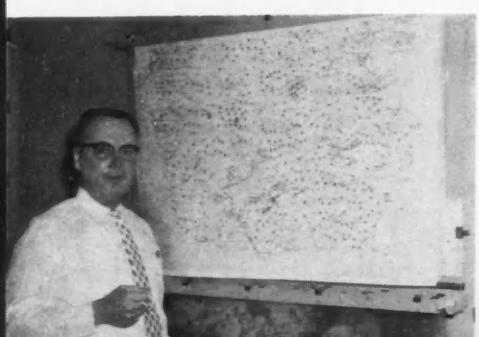
F-80's for Titan

Experience counts! The Air Force needed mobile communication centers for Titan Missile sites; Stromberg-Carlson has built similar trailer-mounted dial offices for telephone companies, so it had the know-how to deliever field proven equipment on the day required. Huts were air-lifted to destination.

MATS "Globemaster" easily swallows three completed huts.

Map revision is big job for Iowa Assoc. Secretary

Want to make some easy money on the side? Sell maps of the State of Iowa to Bill Miller, secretary of the Iowa Association; he has to revise his every few days. Telephone operation in this state has come most of the way from "vigorous independence" to business maturity. As late as 1945 there were 550 telephone companies and over 6,000 switcher lines, many of which were fully incorporated as "companies." Sheer numbers was in itself a deterrent to modern service. Bill Miller's problem has been to advise and counsel so that the climate of Independent enterprise can be preserved during the reorganization that is inevitable if a strong Independent industry is to emerge.

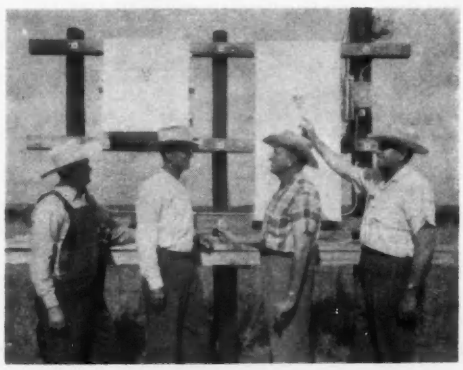


Bill Miller's maps of Iowa telephone exchanges are being revised constantly. Progress is never easy, but Bill can point to the very considerable advances in the last two or three years; is optimistic about strengthening of the industry in his state.

Expansion, present and future

Texas

Stromberg-Carlson 561 Subscriber carrier was the most practical answer for the Comanche County Telephone Co-op Assn. to bring service to 36 new rural subscribers. Shown by a 5-channel pole box and associated standby-power cabinet are (r. to l.) Orey Beatty, president; Jess Hanson, vice-president; two very happy subscribers.



Missouri

The United Telephone Company of Missouri pushes hard at its goal of 100% dial operation. The year 1960 saw more than 15,000 subscribers receive dial service; among the larger towns converted were Salem, Harrisonville, Pleasant Hill and Tarkio. The Warrensburg office will furnish dial service to about 5,000 subscribers and become an important toll center for the growing areas southwest of Kansas City.

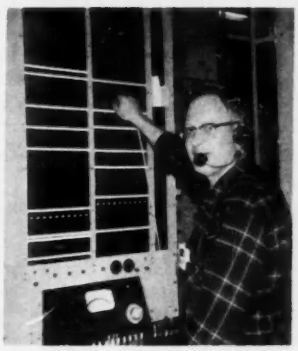
Haines, Oregon, McCall, Idaho, subcribers benefit from progressive steps by well-established companies

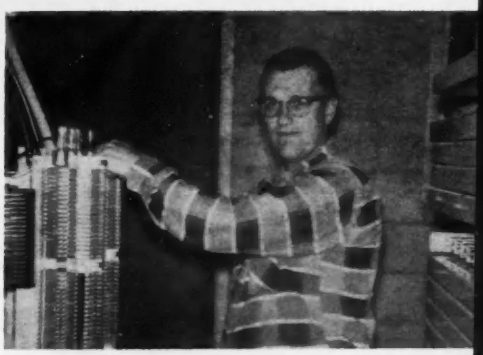
Two telephone companies with a combined total of more than 80 years in the business have provided their subscribers in Oregon and Idaho with modern dial service.

At McCall, Idaho, the Gem State Telephone Company closed a productive year by cutting over another XY® Dial exchange, the 5th in its network. Started in the 1920's by president Harry R. Bean, the company has grown from 15 to 1700 subscribers.

D. G. "Grid" Rowles, manager of Gem State Tel, was a busy man supervising the activity as the 700-line dial equipment was placed in service.

H. R. Bean, right, president, and D. G. Rowles, manager, of the Gem State Telephone Company, are happy about the new XY Dial exchange, the 5th and largest in their organization.





Suzzie Dix, daughter of Vance Dix, gets an assist from the furniture as she makes her first dial call . . . Jim Dobson, equipment engineer for Gem State Telephone Company, uses the Type E test board to check out a trunk . . . Vance Dix, manager at Haines, improved service by replacing 50-year-old switchboard with modern, reliable XY equipment. Old board is now in museum.

Attending the cutover were several prominent Idaho telephone people including: Mr. and Mrs. Donald Dickson of Project Mutual Telephone Co-op, Rupert; Mr. and Mrs. Victor Redman, Albion Telephone Co., Albion; Mr. and Mrs. Roy Arnold, Mountain States Tel and Tel, Boise.

In Haines, Oregon, two events took place almost simultaneously. Vance Dix cut over his Haines exchange to XY Dial and presented the old switchboard to the Eastern Oregon Museum. The board had served the community for nearly 50 years.

Mr. Dix, who also owns the Medical Springs (Ore.) Telephone Co., worked hard to get his company ready for dial. Major improvements were made in the outside plant. A fireproof section was added to his telephone building to house the equipment.

The Haines office, which was purchased by Mr. Dix in 1957, will use no prefix letters, but will operate as an all-number exchange.

John Dillard, manager of Nehalem (Ore.) Tel and Tel, lends a hand at Haines cutover by removing fuses from old main frame.

The ladies turned out in force for the McCall cutover. Left to right, Mrs. D. G. Rowles, Mrs. Victor Redman, wife of Albion Telephone Co-op manager; and Mrs. H. R. Bean, wife of the president.

Engineers continue flow of technical papers

Rapid advances in the field of telephony call for careful evaluation of present practices. Stromberg-Carlson engineers are constantly searching for new and better ways to improve telephone service. Their findings appear regularly in publication form and have been delivered to various groups interested in the progress of the industry.

Here is a list of some of the technical papers soon to be delivered by Stromberg-Carlson personnel. These have been submitted for presentation at the Winter Meeting of the American Institute of Electrical Engineers in New York at the end of the month.

M. A. Clement

R. R. Mina

M. A. Clement's "Economical Usage of Magnetic Tape Recording in Toll Ticketing" deals with procedures which were used in determining proper tape length for recorders in a Type 40 Toll Ticketing office. Since a standard tape length is required for all recorders in the system, traffic and trunking calculations are all-important in determining the best length.

The paper stresses that the critical point in recording occurs when the number of recording circuits required to handle the traffic approaches the point where a re-grading of trunks serving them is imminent.

The value of a set-time readout is discussed. The paper also points out how smaller companies can profit from non-daily readout when conditions permit.

Correctly estimating the number of switches necessary for proper P.P.C.S. (Person-to-Person Collect and Special Instruction) service is the aim of *R. R. Mina's* "Traffic Considerations in Toll Ticketing."

Existing traffic tables do not supply sufficient information on unsymmetrical grading serving different types of circuits. Through a series of mathematical calculations using the Erlang B modified formula for limited sources, data is developed for determining the number of trunks necessary to achieve the desired grade of service.

The same method is applied to check the adequacy of present graded traffic capacity tables for limited sources.

"A Magnetically Regulated DC to DC Converter Power Supply," by *Guenter Sager*, outlines the engineering problems concerned with developing a unit that converts 24 volts to 9 volts and 2 volts for serving transistor circuits of an electronic telephone exchange.

These advantages of the d.c. to d.c. converter principle are stressed: existing battery installations can be used; circuit design is not restricted by supply voltage considerations; efficient regulation of output voltages can be accomplished in the a.c. stage through a.c. regulation methods.

The converter uses semiconductor

G. Sager

H. H. Smith

and magnetic core devices as main elements and performs with a high degree of reliability.

Homer H. Smith's "Automated Toll Traffic Requiring Operator Assistance" discusses equipment which was developed to supply the P.P.C.S. function with a minimum of change in existing equipment and operating practices.

The paper develops the idea that the access code problem is most acute in the small tributary office and that two-way trunks are the most economical method of connection. The new equipment was designed with this in mind. It was also designed without need for special toll board equipment or special positions.

The course of an operator-assisted call is traced through a toll center and operator techniques for each step are explained.

T. R. Redington

O. A. Jorgensen

"A Low-Cost Number Identifier for Small Telephone Systems," by *T. R. Redington*, indicates a solution to the problem of number identification for small telephone companies. Formerly, most automatic number identifiers were not economical. Manual systems were subject to operator error and subscriber fraud.

The new automatic identifier is economically feasible because it reduces common equipment cost. This is possible through the use of a neon diode matrix which consists of clusters of four neon diodes and a resistor assigned to each connector terminal in the office.

The identifier, designed primarily for step-by-step systems, may be applied to any electromechanical system having a third wire or sleeve lead.

O. A. Jorgensen's "Automatic Dialing and Electronic Selection on Railroad Message and Dispatcher Circuits" discusses the trend toward the use of electronic devices in modern railroad communications. Low level tone signal techniques are used for automatic calling and selection on multi-party single line facilities.

Transistorized transmitters, and receivers are used in the system which will serve up to 60 stations on one pair of wires. Single tone signals are transmitted for seizure, dialing and release.

A description of components and features of the new system is given.

Transmitter

GEORGE B. FORBES, Editor
J. T. LONG, Associate

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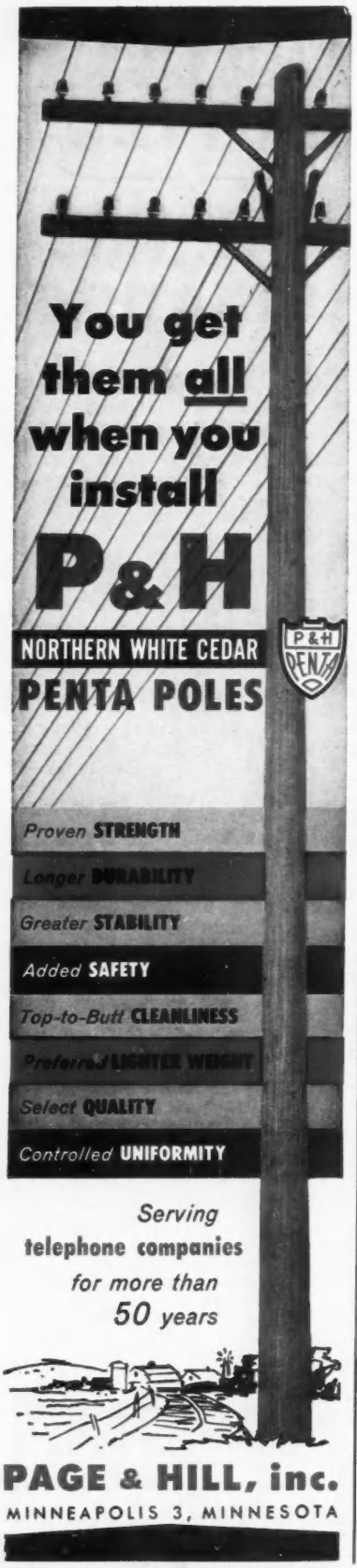


THE BACK OF THE BOOK

By JOHN G. REYNOLDS

TELEPHONE ENGINEER AND MANGEMENT'S 1961 INDUSTRY FORECAST

SHORTLY before the last "Forecast Report" was analyzed by our Research Department a friend of ours called to explain the "late arrival of his report." This was typical of the cooperation we received from hundreds of industry members who aided us by providing complete data on the operations of their companies for 1959 and 1960, and estimates for 1961. Without their cooperation this 1*st Annual Industry Forecast Issue of TE&M* would have been impossible.

Help From The Field

IN FACT, if this issue pleases readers, as we hope it will, its success is due to (1) the over 400 telephone company executives who took valuable time from their busy days to answer our questions; and (2) the executives of various telephone equipment manufacturing companies who also answered our questions and provided us with the data we requested.

To the telephone operating companies, the manufacturers and suppliers we extend our *thanks*. We hope you will be pleased with our handling of the data you provided. Your comments will be appreciated.

Help From The Authors

WE ALSO wish to thank our contributing editors, *Bill Corman, C. D. Ehinger, L. A. Gritten, G. M. Jones, D. A. Perigo* and *Allan R. Stacey*, and our Technical Editor *John S. Reed* for the articles they prepared for this issue. And a big vote of thanks is due to Chicago's North Shore Calculating Service for checking our figures and catching our errors.

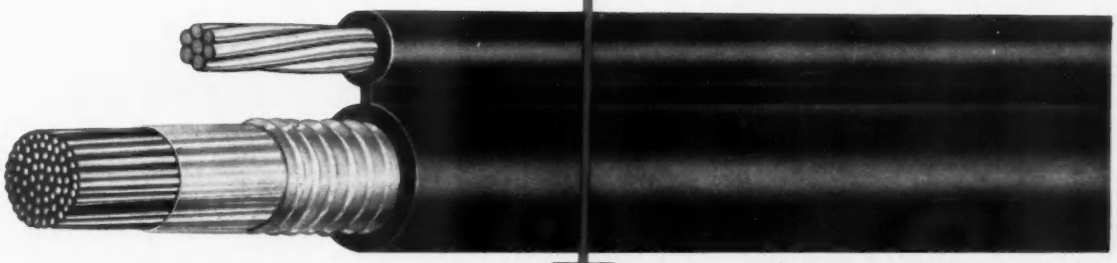
"Gumption" Needed

IN RESTROSPECT, we are glad TE&M's staff waited until '61 to issue this first "Forecast Issue." Had TE&M tried the job in January, 1960 it might have gone along with the big predictions that were made for the "Soaring, Sizzling, Roaring or Golden Sixties." As it is now, TE&M is sure on several points: (1) the U.S.A. has enjoyed such constant improvement in the economy since the war that periods of slowdown seem worse than they are; (2) 1960 saw the U.S.A. in the most prosperous recession in history; and (3) 1961 will be as one of our telephone company friends told us — "*the best of possible years provided you have the gumption to make it so!*"

Cuts Down Gossip

TRANSPARENT telephone booths, made of unbreakable glass, have been installed in the post office at Mannheim, West Germany. The idea is to make customers get their calls over with in a hurry, because they can't stand the glares of persons waiting in line. The postal authorities, who run the West German telephone system, are pleased with the results. (Probably convinces lots of people to write a letter instead.)

Exchange Area Cable that cuts installation time **in half!**



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A tough polyvinyl chloride jacket is extruded over both core and messenger.

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Take a man like
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Following service, he returned to North Judson, Indiana, where he worked in sales, and rose to manager of a local business. He was also active in the Lions Club, Chamber of Commerce, and the church choir.

Dick joined General Telephone Directory Company in 1955 as a foreign sales representative in Michigan City, Indiana, and was supervisor of foreign sales by 1958. One year later, he was promoted to Sales Supervisor of the Owosso, Michigan, local unit.

Dick, his wife, son and two daughters are an energetic family . . . good neighbors. Though in Owosso less than a year, you'll find the Nielsens already active in community affairs.

Men like Dick Nielsen are an asset to any community. It's a common trait of the "Revenue Men" who work for the General Telephone Directory Company . . . and for you.

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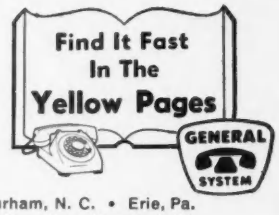

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